NOV. 13 1959

# PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

Oil Trims Capital Spending Plans for 1960

Page 19

Process Improvements Cut Refinery Costs

Page 32

Cost could enter 'area' gas prices ..... 28
Higher production outlays needed ..... 30
Refinery blasts teach safety lesson ..... 87
Pipeline integrates three refineries ..... 102
Arabs talk up unified oil policy ..... 108
Are small refiners courting danger? ..... 116
Jobbers benefit by 'gas' tax change .... 122

Price 50 Cents

UNIV MICROFILMS INC
EDITORIAL DEPT
313 N FIRST ST
ANN ARBOR MICH

*Let your plans include the specialized knowledge and resources of the nation's Pioneer Oil Bank.*

**84th Year of Dependable Service**

**FIRST NATIONAL BANK IN DALLAS**

*Member Federal Deposit Insurance Corporation*

*Introducing—*

# D-500 Fire Hose

*—for a surer kind of protection under fire*

Here's hose with all the dependable durability a 500-lb. factory test assures-plus lighter-weight construction that makes for easy handling. It's highly flexible and *stays* that way. And it's mildewproof.

Petro-chemical users will cash in on its unsurpassed oil- and chemical-resistance – inside and out. In fact, that's important to any user of the newest fire-fighting chemicals. And D-500 Fire Hose is available with white, black, yellow or red cover for ready visibility as well as for those who require color-coded fire-fighting lines.

What's more D-500 Fire Hose is guaranteed throughout its long life against defects in workmanship and materials. For the full story of this newest advance in fire-fighting equipment, contact the G.T.M. through your Goodyear Distributor—or by writing Goodyear, Industrial Products Division, Akron 16, Ohio.

**IT'S SMART TO DO BUSINESS** *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*

Photograph courtesy of American LaFrance Corporation

INDUSTRIAL FIRE HOSE BY

**GOODYEAR**

THE GREATEST NAME IN RUBBER

# New Process

# * GUARANTEES

## Lowest Product Recovery Cost
## Shortest Unit Payout Time

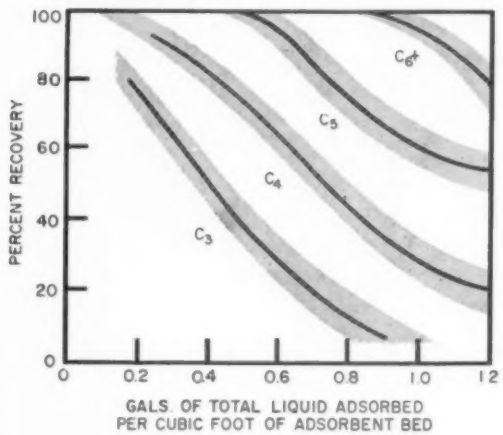
**The Adsorption Process**

## DELTA DRYEX GASOLINE PLANT

**The most economical commercial gasoline, butane and propane recovery process ever designed.**

* Delta quotes a turnkey onstream installation with guaranteed recoveries.

- **A new concept for natural gasoline, butane and propane recovery.**
- **Recovers *both* natural gasoline and NGAA specification butane and propane.**
- **You get more product at a much lower cost (half in many cases) than any other commercial process.**
- **You are assured of shortest unit payout time.**
- **Dryex adsorption gasoline plants are complete including fractionation and refrigeration equipment which yield NGAA specification products.**




Dryex gasoline plants open a new realm of profit possibilities. Even those gas streams considered for other processes in the past and eliminated as economically impractical should be reviewed for a Dryex gasoline plant application.

**LET DELTA ANALYZE YOUR GAS STREAM TO DETERMINE THE VALUE OF DRYEX TO YOU**

Patent No. 2,880,818 dated April 7, 1959

***For Brochure and Complete Information, Write:***

## DELTA

**DELTA TANK MANUFACTURING CO., INC.**

**P. O. BOX 1469 • BATON ROUGE, LA. • TEL. Dickens 3-5701**

# PETROLEUM WEEK

**Publisher**—Ervin E. DeGraff
**Editor**—LeRoy Menzing

**Managing Editor**—Richard M. Machol
**General News**—Robert E. Spann, editor; J. Richard Shaner, Larry Christiansen, Jr.
**Columnist & International Editor**—Wanda M. Jablonski
**Regional Editor**—Glenn Green, Jr. (Houston)
**Management Editor**—John Barton
**Exploration, Drilling & Production**—Ade Ponikvar, editor; Jim Bower
**Processing & Petrochemicals Editor**—Rene J. Bender
**Pipeline, Tanker & Storage Editor**—Vincent W. De Salvo
**Foreign News**—Georgia Macris, Robert F. Doviak
**Marketing Editor**—Robert L. Siegel
**Market Trend**—Halsey Peckworth
**District Editors**
*Dallas*—Marvin Reid *Tulsa*—Jim Mayes *Bakersfield*—William Rintoul
*Houston*—Eugene Bush *Chicago*—Stewart Ramsey *Los Angeles*—Kemp Anderson
**Presentation**—William A. Caperell, Jr., director; Mildred Schutte
**Editorial Assistants**—Dorothy Miller (Chicago), Carole A. Masucci, Margaret Graham
**Librarian**—Helen T. Schaefer **Reprint Service**—Joanne Florio
**Domestic News Service**
*Chicago Bureau*—Elizabeth L. Wilson, Bruce Cross
*Cleveland Bureau*—Arthur Zimmerman, chief; Violet Forsha
*Dallas Bureau*—Mary Lorraine Smith, Alice Mann
*Detroit Bureau*—Donald MacDonald, chief; Sally Ayling
*Los Angeles Bureau*—Michael Murphy, Jack Meyer, Marvin Petal
*San Francisco Bureau*—Jenness Keene, chief; Donald Winston
*Washington Bureau*—George B. Bryant, Jr., chief; Glen Bayless, Dean Reed, D. O. Loomis, Roy Calvin, Ernest Conine, Seth Payne
*Correspondents:* Albuquerque, Anchorage, Atlanta, Austin, Baton Rouge, Billings, Bismarck, Calgary, Casper, Cheyenne, Corpus Christi, Denver, Edmonton, Evansville, Farmington, Ft. Worth, Jackson (Miss.), Little Rock, Midland, Mobile, Montreal, New Orleans, Odessa, Oklahoma City, Ottawa, Philadelphia, Phoenix, Pittsburgh, Regina, Sacramento, Salt Lake City, Seattle, Shreveport, Toronto, Vancouver
**Foreign News Service**
*Middle East Bureau*—Onnic Marashian, chief
*Caracas Bureau*—John Pearson, chief
*Bonn Bureau*—Morrie Helitzer, chief; Silke Brueckler, Jim Morrison, Helga Berendt
*London Bureau*—John Shinn, chief; John Tunstall, Derek Barlow
*Mexico City Bureau*—Peter Weaver, chief; Lourdes Marin
*Moscow Bureau*—Robert Gibson, chief; Victor Louis
*Paris Bureau*—Robert E. Farrell, chief; Helen Avati, Arthur Erikson
*Tokyo Bureau*—Sol Sanders, chief; Toshiko Matsumura, John Yamaguchi
*Correspondents:* Amsterdam, Ankara, Bogota, Bombay, Brussels, Buenos Aires, Cairo, Djakarta, Geneva, Guatemala City, Havana, Karachi, La Paz, Lima, Manila, Melbourne, Rabat, Rangoon, Rome, San Jose, Sao Paulo, Teheran, Vienna
*Manager, McGraw-Hill World News Service*—John Wilhelm, Margaret Ralston, managing editor
**Economics Staff**—Dexter M. Keezer, director; Robert P. Ulin
**Assistant to the Publisher**—William F. Bland
**Business Department**
*Advertising Service Manager*—John E. Thompson; *Western General Manager*—Donald O. Hanson; *Circulation Manager*—Harriet Costikyan; *Promotion Manager*—N. F. Cullinan; *Research Manager*—Leo M. Murray; *Advertising Makeup*—P. J. Callahan
**Other McGraw-Hill Petroleum Publications**
NATIONAL PETROLEUM NEWS PLATT'S OILGRAM NEWS AND PRICE SERVICES

A McGRAW-HILL PUBLICATION

**PETROLEUM WEEK** **NOVEMBER 13, 1959**
**Vol. 9, No. 20**

Published weekly by McGraw-Hill Publishing Co., Inc. James H. McGraw (1860-1948), founder. Publication office: 871 N. Franklin St., Chicago 10, Ill. See panel below for directions regarding subscriptions or change of address.

**Executive, Editorial, Circulation and Advertising Offices:** 330 W. 42nd St., New York 36, N. Y. Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice President; L. Keith Goodrich, Vice President and Treasurer; John J. Cooke, Secretary. Officers of the Publications Division: Nelson L. Bond, President; Harry L. Waddell, Senior Vice President; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator.

Subscriptions are solicited only from executives, supervisors, and technically trained personnel in the oil and natural gas industries, who are engaged in exploration, drilling, producing, processing, petrochemical manufacture, transportation, or wholesale marketing. **Position and Company connection must be indicated on subscription orders.** Subscription rates for all countries: $3 per year. Single copies 50¢. Second class postage paid at Chicago, Ill. Printed in U.S.A. Title registered in U.S. Patent Office.

© Copyright 1959 by McGraw-Hill Publishing Co., Inc. All rights reserved.

**Unconditional guarantee:** Our primary aim is to provide subscribers with a useful and valuable publication. Any comments or suggestions for improvement will be most welcome. On written request from any subscriber, the publisher agrees to refund the unused portion of the subscription price.

**Subscriptions:** Address subcription correspondence and change of address to Fulfillment Manager, Petroleum Week, 330 W. 42nd St., New York 36, N. Y. On address changes please give old and new addresses and zone numbers, if any, and enclose an address label from a recent issue if possible. Please allow one month for change to become effective.

**Postmaster: Please send form 3579 to Petroleum Week, 330 W. 42nd St., New York 36, N. Y.**


## INSIDE *Slant*

### TIMES WERE TOUGH THEN

This day of tight money and tight supply of oil country tubular goods isn't new to those in the petroleum industry.

In fact, the present situation led a representative of a supply firm to recall recently an amusing incident that happened a few years ago, when one of his customers found money and casing a bit hard to come by.

The customer had purchased a string of used pipe, and the salesman was anxiously awaiting the check in payment when he received an urgent call.

"Have you got any influence with your company?" asked the customer.

Uncertain as to why the inquiry, and what answer to give, the representative did quite a bit of stalling before answering:

"I'm not sure. Just what do you want?"

"I need some plate," replied the customer.

"Well, I don't know about that," answered the salesman, who realized that plate was in tight supply, and that a lot of conversion deals were being made. "What do you want to do with it?"

"I need the plate to patch that damn second-hand pipe that you sold me," quickly shot back the customer.

LeRoy Menzing
EDITOR

**Congrats and $25 for this quip to CAROLYN KENEDY, Bells Wells Oil Company, Box 269, Miami, Oklahoma.**

When it comes to shapeliness . . . Lone Star pipe proportions are right! All dimensions and qualities are strictly API specifications.

Lone Star Steel . . . America's most modern pipe plant . . . is Joe Roughneck's solid source of supply. Right here in the center of the oil country . . . quick availability of Lone Star pipe is a terrific convenience.

**Neighbor, wherever you are, specify Lone Star and we both get a good deal.**

© 1956 Lone Star Steel Company

**Lone Star STEEL COMPANY**

EXECUTIVE—SALES OFFICES
W. Mockingbird Lane at Roper • P. O. Box 12226 • Dallas, Texas
DISTRICT SALES OFFICES
912 Republic National Bank Building, Dallas, Texas
Houston, Texas | Midland, Texas | Tulsa, Oklahoma

## DEPT/Opinions

# Views That

"No one has a right to get certain prices or a definite differential between his product and others, any more than he has an inherited right to hold a certain percentage of the market."

—GEORGE D. MCDANIEL
*Manager, dealer and distributor relations*
*Mobil Oil Co.*

"If there were no restrictions [on exploding a nuclear device in Project Oil Sand], it appears as if we could be pumping oil out in the near future, that is in a few years, at about $1 a bbl."

—C. E. VIOLET
*Test division leader*
*Lawrence Radiation Laboratory*
*University of California*

"I see no need to worry about an oil shortage in the free world, even though we lose Middle East oil."

—DR. LLOYD L. WITHROW
*Head, Research Fuels & Lubricants Dept.*
*General Motors Corp.*

"I liked the oil practice. The oil man didn't criticize you for losing a case now and then. With them, it was like drilling a dry hole—we could get 'em next time."

—JOHN E. HICKMAN
*Chief Justice, retiring*
*Texas Supreme Court*

"Economics usually dictate that some tolerance be allowed in a specification to permit reasonable variations in quality. It can be a serious mistake . . . to write a specification just on the basis of the quality of current supplies which may be available in a local area. Such supplies may happen to be much more restrictive than actual equipment needs, and the specification may needlessly condemn a perfectly acceptable oil in another area."

—W. J. SWEENEY
*Vice-president*
*Esso Research & Engineering Co.*

"The inability of California-produced oil and gas to meet the ever increasing demand for energy on the West Coast certainly should not be viewed with alarm. Never have the people and industry of the West Coast had so many established and assured sources of energy as are available to them today."

—WILLIAM F. KIRK
*Manager, economics department*
*General Petroleum Corp.*

"It appears somewhat ridiculous for the government, which is now having

# Make News . . .

to pay 4% to 5% for its money, to loan money to the electric co-ops at 2%. If privately owned utilities are forced to pay 5% to 6% for their money, and also to bear the tax burdens which co-ops escape, the rates which such privately owned utilities, gas, electric, and telephone, will have to charge for their services may well bring on public clamor for government or public ownership."

GEORGE R. PERRINE
*Chairman*
*Illinois Commerce Commission*

# . . . and Letters

Dear Sir:

Reference is made to the article entitled "Israel Gambles on Oil Exports" [PW—Oct.2'59,p34]. This article contains this statement: "Paz Ltd., a British-owned firm controlled by department store magnate Isaac Wolfson, bought the refinery late last year from Shell and British Petroleum. Paz had previously purchased their joint marketing interests in Israel."

This statement is in error. Paz did not buy the refinery and does not now own or operate the refinery, which is owned and operated by Israeli interests in behalf of the petroleum marketing companies in Israel.

LAWRENCE SPIRER
*Sonneborn Associates*
*Petroleum Corp.*

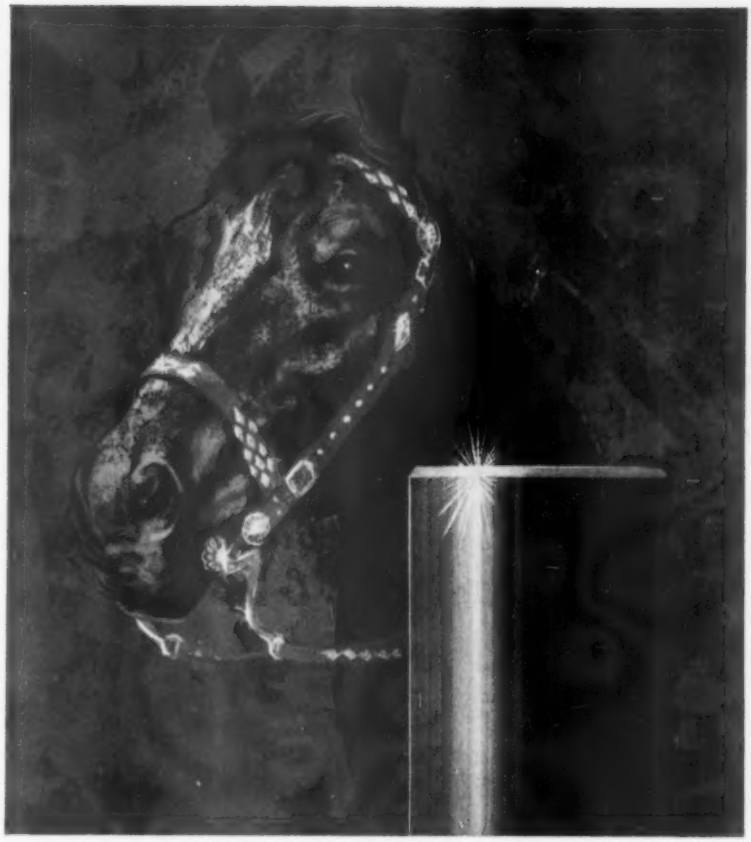
Dear Sir:

Being a loyal San Franciscan, I respectfully call your attention to the heading on your article, "Black-Jack Pickets Hit Frisco Stations" [PW—Oct.2'59,p52].

While the abbreviation "Frisco" is commonly used throughout the U.S. in referring to San Francisco, the residents of San Francisco do not like to have the city referred to with this abbreviation. In fact, they resent it, and I am therefore taking the liberty of calling this matter to your attention, as I am sure other residents of San Francisco who read PETROLEUM WEEK feel the same way as I do.

BERT I. GRAVES
*B. I. Graves Associates*

PETROLEUM WEEK *will publish reader comments each week. Address letters to LeRoy Menzing. Editor,* PETROLEUM WEEK, *330 W. 42nd St., New York 36, N. Y.*

GEM
OF THE
OIL AND GAS
INDUSTRY

Lone Star pipe, a real thoroughbred, is the odds-on favorite in the oil and gas industry. Precisely made by proud craftsmen . . . Lone Star casing, tubing and line pipe meet exacting API standards.

Strictly a quality product . . . Lone Star pipe is formed from fine steel, then fully normalized . . . with multiple inspections assuring long, dependable service. Put your money on Lone Star. You can't lose . . . and you gain much!

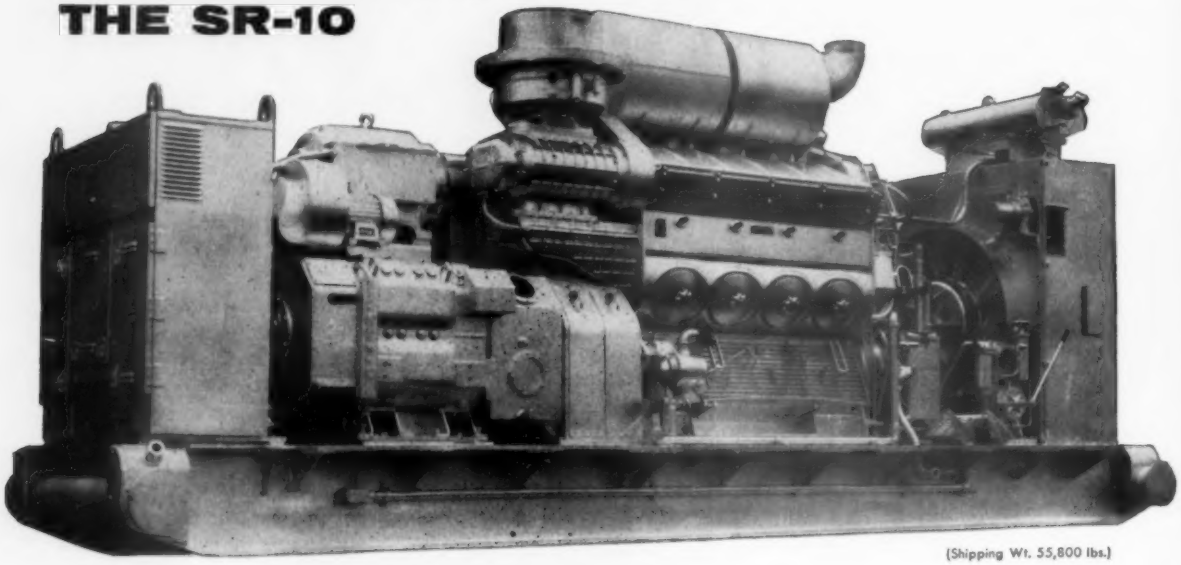
Lone Star STEEL COMPANY

EXECUTIVE—SALES OFFICES
W. Mockingbird Lane at Roper • P. O. Box 12226 • Dallas, Texas
DISTRICT SALES OFFICES
912 Republic National Bank Building, Dallas, Texas
Houston, Texas | Midland, Texas | Tulsa, Oklahoma

# ELECTRO-MOTIVE

## —*for deep drilling*

## THE SR-10



(Shipping Wt. 55,800 lbs.)

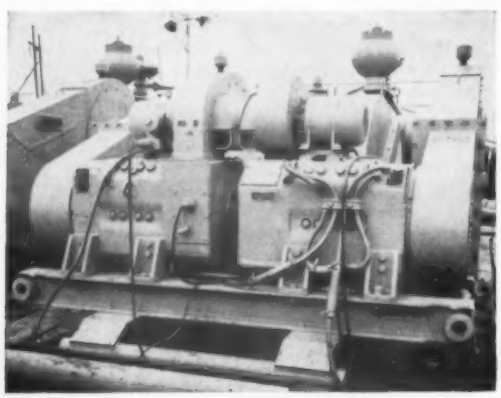
### The standard of Diesel-electric power

Electro-Motive power has been picked for more deep well applications than any other Diesel-electric system. Its record of dependability, low maintenance and economy, recorded under every conceivable operating condition, have made it the outstanding choice for both land and offshore applications. Most important, it is the *only* deep well Diesel-electric system manufactured and backed by one company.

The SR-10 is the newest Electro-Motive deep well power unit. It is the first standardized, completely self-sufficient power system. An integral AC generator eliminates need of outside AC power for blowers, excitation and control equipment. The 1000 hp 8-cylinder Diesel engine drives two generators that produce 640-KW each. Models are available for Dual-fuel operation.

### Sensitive, accurate control

Controls for the SR-10 combine the "feel of steam" with the instantaneous response and accuracy of electric drive. Compact, centralized panel gives the driller supervision of all Diesel-electric equipment including safety shutdown.



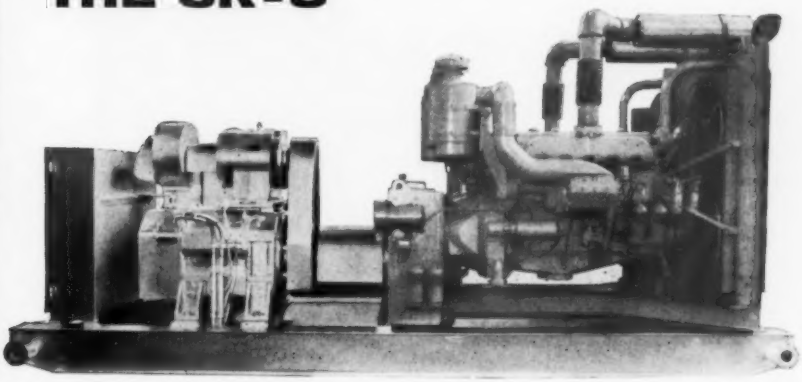
### Flexible, positive power

Drive motors for the SR-10 deliver up to 800 hp. The D-49 motor provides smooth and rapid acceleration of loads with positive control of speed and torque. Both drive motors and generators are identical except for field windings, a factor that reduces service costs.

# POWER

## —*for medium depth drilling*

## THE SR-5



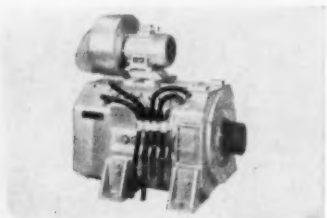
### Simple, economical, adaptable

The SR-5 was specifically designed to meet the needs of medium depth drilling. It combines extreme simplicity of design in a compact, portable assembly that saves hours and dollars on rig-up, tear-down and moving operations. Though new in concept, the SR-5 contains the tested dependability, low operating and maintenance features of Electro-Motive SR-10 equipment.

The Basic SR-5 set is a two generator, two drive-motor arrangement. By combining units, drilling power can be tailored to the job for the most economical power arrangement. Skid unit is pictured with a Detroit Diesel engine, though any engine (gas or Diesel) of comparable power may be used.

### Driller's Control

Simple control panel of SR-5 requires no special training or electrical knowledge. Sensitivity of controls permit driller to maintain a high drilling rate with complete accuracy and balance.



### D-49 drive motor

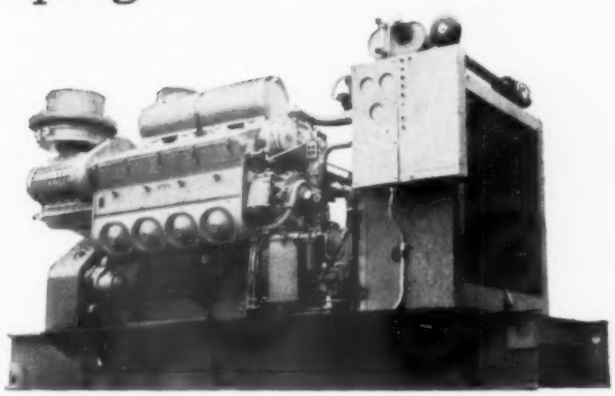
The SR-5 utilizes standard and tested motor components. Electro-Motive drive motors are perhaps the most widely used electric motors for drilling applications. Their dependability and torque characteristics offer speed and power flexibility to meet all drive requirements.

## —*for dependable pumping*

## THE SK-10

For large capacity pumping operations, the Electro-Motive SK-10 provides a compact and portable skid unit, complete with cooling system and engine controls. The seasoned 567 engine is well suited to the torque and horsepower requirements of pumping applications. The engine is balanced to eliminate any vibration between the set and accessories.

The dependability, low maintenance and economical fuel characteristics of the SK-10's engine have been inherited from General Motors' more than twenty-seven years of Diesel engine manufacture. SK-10 units are available for Dual-fuel operation and heat exchanger cooling.



(Shipping Wt. 32,000 lbs.)

**ELECTRO-MOTIVE DIVISION · GENERAL MOTORS**

LA GRANGE, ILLINOIS • **Petroleum sales offices:** Houston and Los Angeles

**In Canada:** General Motors Diesel Limited, London, Ontario

# A message to the people who sell oil... about selling more oil!

Writing advertisements to the people who sell gasoline and oil is a little unusual for us.

Most of our advertisements are written to the people who *buy* gasoline and oil. And they have been since 1911, when we got our start by selling people on the idea of trading in their horses for a new kind of carriage that didn't need one.

Since then, we've helped sell these people almost everything connected with cars—batteries, ignition systems, antifreeze, spark plugs, service, parts, accessories, and tires.

Just about everything, in fact, except gasoline and oil. Even though almost everything we do and every marketing study we make would be as helpful and enlightening and as applicable to the oil industry as it is to our automotive and automotive parts clients.

Some time ago we decided to do something about what was obviously a waste of market information, selling power and potential—by appointing a special group to study the oil industry. To do new research and to study our own voluminous files on the trends and objectives of the automotive industry as we know them and as they will affect the petroleum people.

We didn't, however, limit the study to the future. Present problems were just as carefully investigated. *Advertising* problems dealing with the relative importance of brand image advertising, and with the believability of and consumer response to mystery ingredients and octane ratings. *Merchandising* and *Marketing* problems dealing with the need for individually tailored market-by-market promotions designed to keep independents and other "majors" on the defensive. *Sales Promotion* problems dealing with point-of-sale selling by displays and other materials needed to increase the effectiveness of personal selling by the station attendants.

Our oil marketing group has made its report to Campbell-Ewald management, on these few points and many more. We think that one conclusion they draw, and we admit we are prejudiced, makes a lot of sense . . . "that a Detroit agency is more ideally suited to serve a nationally distributed line of petroleum products than is an agency in any other city. It attracts more automotive consumer-oriented marketing talent, and it is the center for all related marketing data-gathering and processing in the automotive field. In addition, the constant studies such an agency must make on the changing mobility needs, new product development in vehicles and patterns of usage would be of invaluable help in petroleum product planning and marketing."

Water isn't the only thing oil doesn't mix with. We know for a fact that it doesn't mix with watered-down claims and senseless superlatives. On the other hand, mixed with good advertising and the hard work kind of market-by-marketing, it should form a very satisfactory solution.

If you're at all interested in discussing this kind of creative chemistry with us, please call Mr. Tom Adams, president, in our Detroit office.

**CAMPBELL-EWALD**
*Advertising Well Directed*

Detroit • New York • Chicago • Los Angeles • Hollywood • San Francisco • Washington • Denver • Atlanta • Dallas • Kansas City • Cincinnati

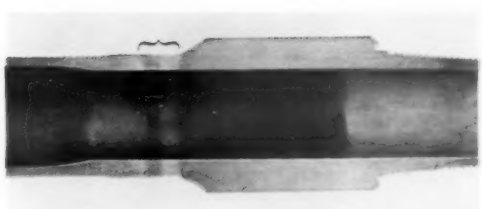
# Magic Ring

## makes Hughes Flash·Weld twice as strong!

A new process, developed by Hughes for heat treating "Flash-Weld" tool joint-to-pipe connections, has resulted in a major advance in drillstem construction. In this process an induction coil is used to normalize and stress-relieve the weld area—more than doubling the tension-impact strength of the connection.

Special electrical equipment, built to Hughes' own exacting specifications, performs this operation. After each joint is flash-welded to the pipe, the weld is automatically positioned inside the "magic ring." Induction heating to closely controlled temperature converts the metallographic structure within the weld affected area — ⅛" to ¾" on each side of weld—to a fine-grained, ductile, strong condition. After cooling, the weld is positioned in a second coil and heated to correct temperature for stress-relieving.

The result — proved in over 200 full scale tension impact tests — is a tool joint-to-pipe connection with metallographic uniformity across the weld that had not heretofore been available to the industry.



This cross-section of a finished "Flash-Weld" tool joint shows the very small area—only about ¾" on either side of the weld — that is affected by the new Hughes induction heat treating process. No other part of the pipe or joint reaches a temperature high enough to alter its metallurgical properties.

50TH ANNIVERSARY YEAR
1909 – 1959

FLASH-WELD
A DEVELOPMENT
OF
HUGHES
TOOL COMPANY
HOUSTON, TEXAS

OSC-3AJ

# 18% FASTER
## TOP HOLE DRILLING...
## 30% more hole !

Newest of the top formation bits is the new Hughes OSC-3A and OSC-3AJ. In comparative runs, this bit has substantially outdrilled previous models. In some instances, drilling rate has been increased as much as 18%, and footage as much as 30%.

The new OSC-3A and OSC-3AJ have been designed specifically to drill the softer, more unconsolidated strata usually encountered in top hole drilling.

The new tooth shape and spacing were determined by extensive performance studies of designs based on the Hughes concept of removing a maximum volume of material from bottom with a minimum of direct contact between the teeth and the formation.

The OSC-3A and OSC-3AJ are currently available in sizes from 12¼" to 18½". In addition to top formations, many operators are using these new bits successfully in drilling medium soft formations.

**HUGHES TOOL COMPANY**

50TH ANNIVERSARY YEAR 1909 – 1959

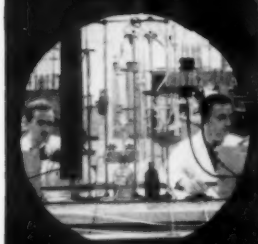
50 YEARS 1909 1959

Chemico's modern research and development center is staffed and equipped to provide industry with a full range of bench scale and pilot scale development services, including:

- ★ Process development and evaluation
- ★ New process research
- ★ Process improvement
- ★ Efficiency improvement of unit operations
- ★ Development of new equipment and products

If an idea is economically sound and technically feasible, Chemico can put it into commercial operation in the shortest possible time. Each research contract is supervised by engineers and technicians familiar with industrial processes, equipment, and designs. Therefore, the transition to profitable commercial application is smooth and efficient. The client can be assured that Chemico will undertake such activities in the framework of a completely confidential relationship.

If you are interested in learning more about Chemico's research activities, please address your inquiries: Attn: TECHNICAL DIRECTOR, at the address below.



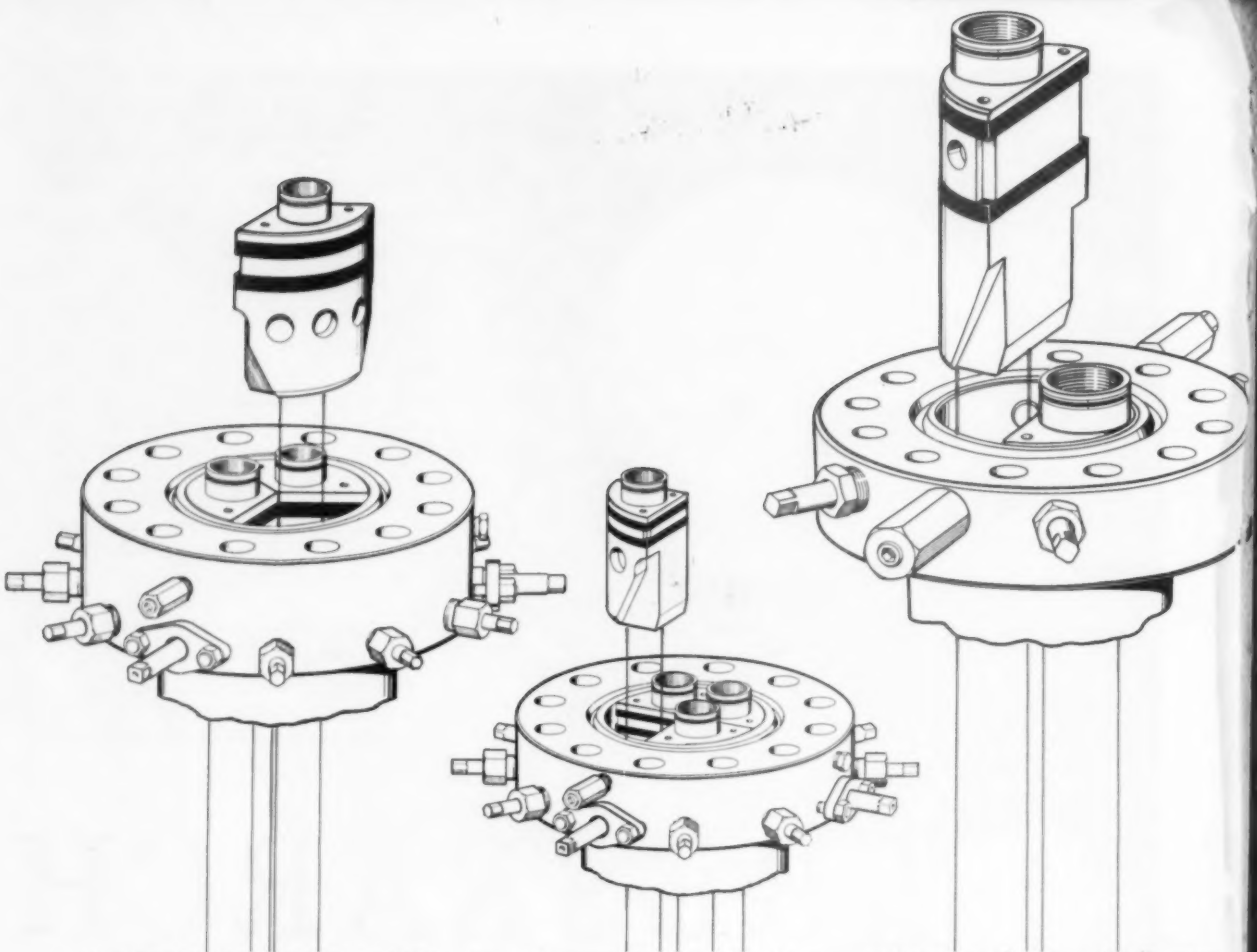
# RESEARCH

## from an engineering point of view

**CHEMICO**

CHEMICAL CONSTRUCTION CORPORATION
[illegible] West 43rd Street, New York 36, New York

CHICAGO • DALLAS • HOUSTON • PORTLAND, ORE. • TORONTO • LONDON • PARIS • JOHANNESBURG • TOKYO



## A CAMERON SPECIALITY

## Multiple Hangers for Multiple Profits

Dual, triple and quadruple producers are great—when they produce the proper profits. But don't overlook the fact that there are differences in various equipment for multiple completions.

Cameron multiple completion hangers, for instance, have design advantages which are the result of constant research conducted to bring you higher profits with safety and convenience. With Cameron multiple completion hangers, strings may be run or pulled independently—you can even run special tools with maximum clearance —under complete pressure control. This is made possible by Cameron's time tested back pressure valves. Every single step of your completion is carried out with the complete safety of our closed pressure method.

Orientation of the segmented hangers is practically fool proof and each hanger when landed will carry full joint strength loads.

Triple seals for final closure leave nothing to chance—afford extra safety at three critical points. Double annulus seals are activated by plastic injection. Steel non-extrusion rings afford positive retention of the self energizing neck seals.

Finally an oil resistant pad provides secondary sealing to prevent pressure from crossing over between each run.

Comparison will prove that these designs offer the safest, most convenient and surely the most profitable well completions on the market today. On your next multiple completion, get the most for your money, get Cameron.

Cameron

**IRON WORKS, INC.**

P. O. Box 1212 — Houston, Texas

Export Office: 7912 Empire State Bldg., New York City. In England: Cameron Iron Works Ltd., 76 Grosvenor St., London W. 1 England.

# 60-Second Summary / WHAT'S HAPPENING IN OIL

November 13, 1959

## dept/INDEX


| | |
|---|---|
| Production | 30 |
| Pipelines | 102 |
| Processing | 87 |
| Marketing | 122 |
| Washington | 28 |
| Statistics | 115 |
| The Market Trend | 116 |
| Key Prices | 114 |
| Editorial | 128 |
| International | 108 |
| Personals | 126 |
| Service & Equipment | 124 |
| Management | 84 |
| Oilmen at Work | 118 |
| Economics | 112 |
| Special Report | 52 |


**Some significant changes in natural gas operations appear ahead now that a federal court has banned end use controls on sales.** More utilities may become buyers in the field, more pipelines may be "for hire," some producers may enter the transmission business. . . . p. 22

•

**Capital spending by the oil industry next year will decline slightly, due to a 4% cut in production outlays.** The industry plans to invest a total of $5,154,000,000 with substantial increases in processing and marketing spending. . . . p. 19

•

**A new interplant pipeline is turning three refineries into one.** The results: greater refining and marketing flexibility—and higher profits. . . . p. 102

•

**Is a unified Arab oil policy taking shape?** The recent meeting of the Arab League Oil Experts Committee paved the way for renewed cooperation on petroleum matters between Iraq and Saudi Arabia—the league's key producing nations. . . . p. 108

•

**The growth in demand will require capital expenditures of between $50-billion and $55-billion for production by 1968.** That was predicted by a New York financial analyst, who says the next ten years will be better than the past decade. . . . p. 30

•

**Refiners are going all out to cut operating costs.** A Petroleum Week special report shows that many processors think the time has come to re-evaluate the basic philosophy behind refinery design. . . . p. 52

•

**A rather unorthodox method was used in completing Arkansas' first quadruple well.** It involves producing gas from two zones through annular spaces, and from two others through tubing. . . . p. 36

•

**U. S. independents in Venezuela were reassured last week that the government doesn't have it in for them.** Oil Minister Perez Alfonzo said some smaller companies had misinterpreted his recent statements. . . . p. 109

•

**Recent explosions are teaching refiners many safety lessons.** Four speakers at this week's API meeting warned that hazards in processing cannot be overemphasized. . . . p. 87

•

**Walnut shells are being used to solve two problems in hydraulic fracturing.** They are being substituted for conventional propping sand in wells where high pressures and hard formations exist. . . . p. 38

# Up to the Minute

## SIGNIFICANT LATE NEWS

November 13, 1959

**Oil country tubular goods and line pipe are moving out of some mills already.** The initial output represented orders caught in the finishing mills when the strike started. By Sunday, though, some mills will be in full swing on new orders. Urgent needs will be filled first, steel executives say, but they warn that the mills will be unable to make much of a dent in the backlog of orders for tubing and small-diameter pipe.

**It will be a long time before the mills turn out enough steel to rebuild depleted store stocks.** Even if production is uninterrupted when the 80-day injunction expires late in January, steel men predict that inventory rebuilding can't start before the end of the first quarter of 1960. And until then, many specialty items will be in short supply.

•

**New Mexico has created a "project allowable" for new waterflood operations.** The new rule, adopted this week, provides that the maximum crude allowable to be assigned to any waterflood project will be determined by multiplying the number of tracts in the waterflood by the unit allowable factor.

•

**American Oil's El Dorado (Ark.) refinery employees voted at mid-week to accept a new contract offer and return to work**—after a 134-day strike. American has also made a new proposal to its striking Texas City (Tex.) employees. The issues at the two plants are similar.

•

**The U. S. Supreme Court has agreed to review two cases involving Federal Power Commission rulings on gas rates and contract life.** Sun Oil Co. asked the court to reverse an FPC ruling, upheld by a lower court, that a second contract signed with a producer at a higher rate represents a rate change rather than an initial rate. Should the court term such contracts initial filings, they would not be subject to refunding if later found to be too high.

Sunray Mid-Continent Oil wants the high court to declare that a gas producer is not permanently wedded to a customer. Sunray wanted to limit a sales agreement to a pipeline company to 20 years, but was turned down by FPC. This ruling, too, was upheld by a lower court.

**The high court will also review the Anheuser-Busch "good faith" price case—a decision that could have an impact on the oil industry.** An appeals court held that price reductions made in one area to meet competition while prices elsewhere are left unchanged do not constitute illegal price discrimination. The Federal Trade Commission, which has a similar case pending against Pure Oil Co., asked for the Supreme Court review.

•

**Last weekend's Houston ship channel tanker fire will bring a new study of loading safety procedures.** The fire, the origin of which was still unknown at mid-week, was snuffed out after large quantities of foam were airlifted from several areas.

Paraffin producers are blending their way to new and profitable markets with Epolene, Eastman's low-molecular-weight polyethylene resins.

Paraffin modified with Epolene has superior abrasion resistance, higher gloss. Epolene improves resistance to flaking and cracking, too, by providing better adhesion and greater flexibility. Other benefits: higher blocking temperatures and resistance to thermal shock.

Epolene is available in four types. All are supplied as small, white pellets for easy handling, rapid blending. These resins range in molecular weight from 1,500 to 6,000 and possess varying degrees of linearity (densities 0.907 to 0.935), providing paraffin formulators with a choice of performance characteristics to meet a variety of processing and end-use requirements.

For further information and samples of these Eastman low-molecular-weight polyethylene resins, or for assistance in evaluating Epolene in your paraffin products, call our nearest representative or write Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Company, Chemical Division, Kingsport, Tennessee.

**Physical Properties of Epolene**

| Property \ Type | N | E* | C | LV |
|---|---|---|---|---|
| Ring and Ball Softening Point, °C | 106 | 105 | 101 | 103-4 |
| Color, Gardner scale, max. | 2 | 2 | 2 | 2 |
| Viscosity @ 212°F (2% blend in 130°F paraffin), cps. | 4.4 | 4.1 | 4.9 | 4.0 |
| Cloud point (2% blend in 130°F paraffin), °F | 181 | 180 | 164 | 172 |

*emulsifiable

**Epolene**

EASTMAN LOW-MOLECULAR-WEIGHT POLYETHYLENE RESINS

**SALES OFFICES: Eastman Chemical Products, Inc.,** Kingsport, Tennessee; Atlanta; Chicago; Cincinnati; Cleveland; Framingham, Massachusetts; Greensboro, N. C.; Houston; New York City; St. Louis. **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

## MAGCOBAR TECHNOLOGY HELPS OPERATORS

cuts the cost of drilling. At Magcobar, drilling mud is a scientifically designed combination of chemicals engineered to meet your drilling conditions as they occur and to result in the lowest possible over-all drilling cost. And with Magcobar you get the right drilling chemicals *used right*—backed by chemists, reservoir engineers, and laboratory facilities. All of this . . .

with drilling fluids that reduce or prevent damage to the pay. Often, completions are quicker, production higher, and there is less need for expensive stimulation work. Because of Magcobar's advances in drilling mud technology, today's wells are worth more to the operator and cost less to produce than similar wells only a few years back. But Magcobar also . . .

# Here's how Magcobar cuts

**BIT LUBE**

is a slightly viscous, oily fluid which gives to drilling fluids many of the properties of an extreme pressure lubricant. Bit Lube protects bit bearings, to increase bit life, and reduces hole friction, resulting in faster penetration with fewer round trips.

**T-8®**

compound is a one-package additive which builds and maintains a shale control mud. Proper use results in lower mud cost, greater hole stability, and more uniform properties.

**MAGCONATE**

is a powerful emulsifier for oil-in-water emulsions. It allows the use of higher bit weights without balling problems. It forms a very tight emulsion, making for lower filtration loss and a reduction in surface tension of the filtrate.

## WELL DONE WITH MAGCO

**LATIN AMERICA:**
General Representative:
Dresser International, Inc.

**BRAZIL:**
Comercial e Industrial de Fornos WERCO, Ltda. Rua General Gurjao 326, Rio de Janeiro

**COLOMBIA:**
Venezuela Equipment, C.A.
Apartado Aerero 4178, Bogotá

**GUATEMALA:**
J. P. Martin, Apartado 1351
Guatemala City

**MEXICO:**
Magcobar de Mexico, S.A.
Edificio Chapa, Despacho 603
Monterrey, N. L.

**WEST INDIES:**
Alstons Limited, Airmail P. O. Box 600 Port of Spain, Trinidad, W. I.

**VENEZEULA:**
Magcobar de Venezuela, C.A.
Apartado 3775, Caracas

Magcobar de Venezuela, C. A.
Edificio UPEMA, Calle 76 cruce con Avenida 12, Maracaibo

Magcobar de Venezuela, C. A.
Calle Venezuela 112
Puerto la Cruz

## HELPS CONTRACTORS

to cut total drilling costs by using the right mud products *right*. Magcobar products and engineering in partnership with the contractor result in faster drilling, greater safety, and a more profitable operation. Magcobar technology helps by reducing friction to increase the life of mud pump parts, reducing torque, swivel wear, load on chains, rotaries, drive system, and engines. Helps . . .

## TO MAKE FASTER PENETRATION

to cut the cost per foot of drilling. Faster penetration means savings in bits, fewer round trips, and fewer operating hours. But the problem of fast drilling is only partially one of chemicals. That is why more and more drillers call Magcobar engineers before starting. This combination of Magcobar products and planned engineering means faster drilling, greater safety, and higher profits.

# drilling costs around the world...

### LEATHER-FLOC®

is a tiny clinging type of fiber that has the greatest sealing capacity against seepage losses of any lost circulation material. It will improve or tighten a seal where a bridge has been established by coarser materials. It improves the seal of loose, large particles.

### SPERSENE

a chemically modified lignosulfonate, is a highly effective thinner in gyp, lime, and salty muds. It is readily soluble in fresh or salt waters. It lowers viscosity more effectively, at less cost, than many of today's leading thinners.

## BAR TECHNOLOGY

**EASTERN HEMISPHERE:**
General Representative:
Dresser A.G.

**MIDDLE EAST:**
Magcobar, Airmail P. O. Box 3432
Beirut, Lebanon

**STERLING AREA:**
General Representative:
Dresser (Great Britain) Limited
United Kingdom:
Magcobar Division,
Dresser (Great Britain) Ltd.
197 Knightsbridge Road
London, S.W. 7

**INTERNATIONAL SALES:**
Magnet Cove Barium Corporation
P. O. Box 6504
Houston, Texas, U.S.A.

*Magcobar Products in the Sterling Area Available for Payment in Sterling in London*

**My-Lo-Jel®**
Drilling mud starch with excellent fluid loss properties.

**Magco-CMC**
A low viscosity carboxymethylcellulose with an active CMC content of 60 per cent.

**Cell-O-Seal®**
Cellophane flakes which retain their strength when dispersed in mud. They are not subject to bacterial action or chemical deterioration.

**Magnet Cove Quebracho**
Readily cold-water soluble, spray dried, thoroughly active quebracho powder.

**Magco-Phos®**
This highly efficient, balanced polyphosphate is one of the most effective chemicals for treating low pH muds.

**My-Lo-Jel® Preservative**
A powerful bactericide for drilling muds that is easy and safe to use.

Magcobar
*Complete*
DRILLING MUD SERVICE

®Tm Reg. U.S. Pat. Off.

# Important News for Gas Men!

# Now You Can Get up to 140°

## Guaranteed Dewpoint Depression!

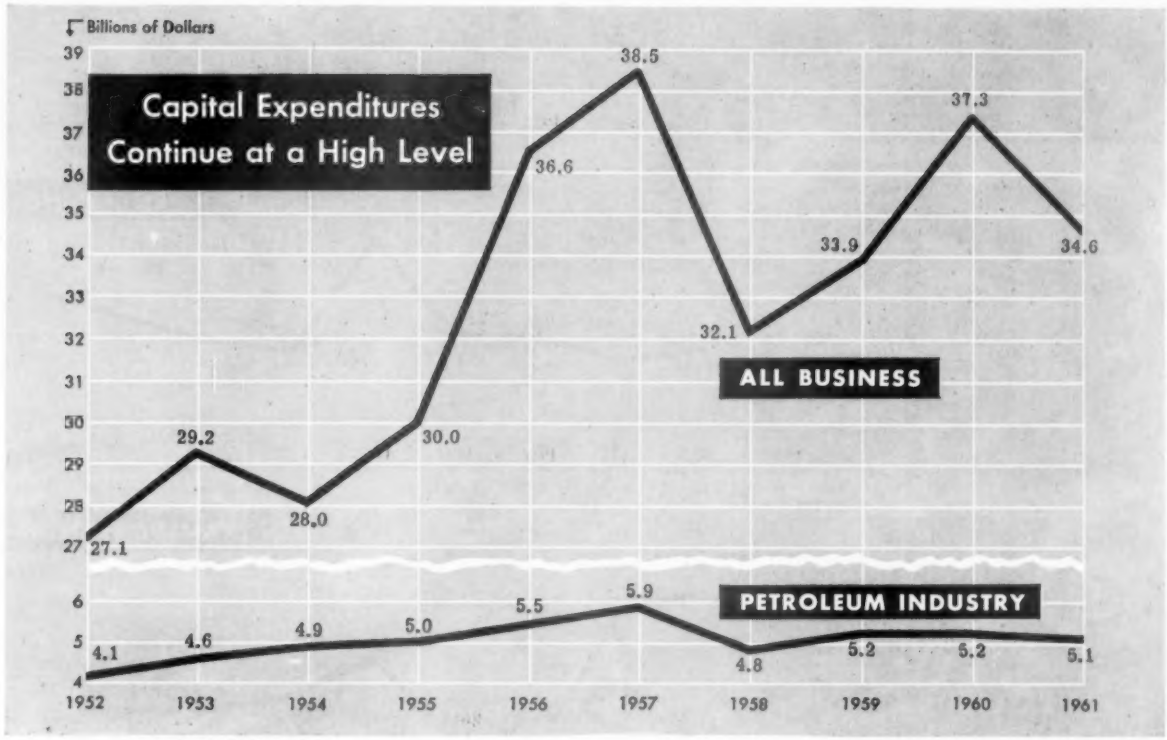
THE NEW BS&B **DEW DROP*** WITH TRIETHYLENE GLYCOL PRODUCES EXTREMELY DRY GAS . . . PERMITS DEHYDRATION AT MUCH HIGHER WELLHEAD TEMPERATURES!

*DEW DROP is a trade name of Black, Sivalls & Bryson, Inc.

*Want More Information?*
*Ask Your BS&B Man, or Write to . . .*

**BLACK, SIVALLS & BRYSON, INC.**

DEPT. 1-EU11 P.O. BOX 1714, OKLAHOMA CITY




*Excess capacity, steel strike mean . . .*

# Oil Will Cut Capital Outlay 1% in '60

**The petroleum industry, influenced by the steel strike and by its excess capacity, now plans to cut its capital expenditures for drilling and production by 4% next year, a reduction that will mean a 1% decline in overall capital outlays.**

The planned total new investments by the industry for 1960 are $5,154,000,000, down 1% from the estimated $5,220,000,000 spent during 1959.

And for 1961, the petroleum industry now plans to spend nearly $5.1-billion in capital funds for drilling and production, processing, liquid transportation, equipment, and marketing facilities.

Those are the findings of the annual fall check-up on capital spending plans conducted during October by McGraw-Hill's Economics Dept.

**Planned total capital expenditures by the oil industry for 1960 and 1961, as well as its spending in 1959, are down slightly from the estimates made by companies last spring.**

The estimated total expenditures in the current year are 2.2% below what the industry indicated last spring. The planned total capital outlays for 1960 now are 3.9% under earlier plans.

**Other than mining, the petroleum industry is the only major industry now planning a reduction in capital spending next year.**

The capital outlays for all business firms add up to $37.3-billion for 1960, 10% above 1959. But the estimated $33.9-billion planned for 1959 by all business is nearly 1% under the spending plans of last spring.

The capital spending plans of other major industries for 1960 show electric and gas utilities (including natural gas pipelines) estimated at $6.1-billion, up 3% over 1959; railroads, $904-million, up 10%; mining, $395-million, down 5%; iron and steel, $1.7-billion, up 76%.

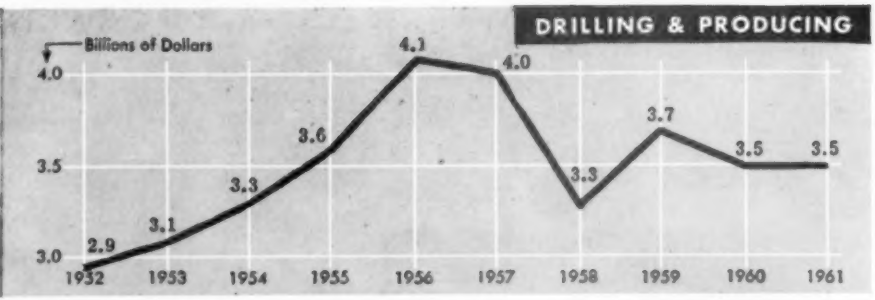
**The impact of the continued world surplus of crude is reflected strongly in the reduction planned for capital outlays for drilling and production in the U.S. next year.**

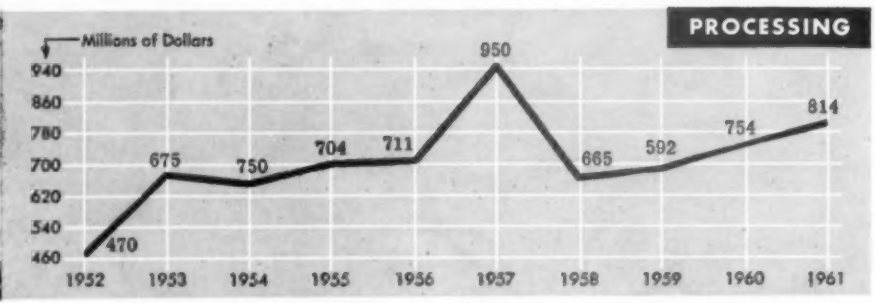
The total of $3,528,000,000 now scheduled to be spent in 1960 is 4% under the $3,672,000,000 spent this year, and is 6.6% under the 1960 plants that were made last spring.

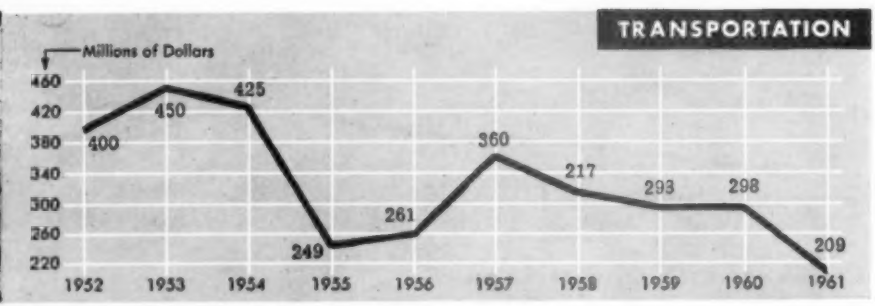
The reduction in capital spending for drilling and production—which reflects outlays for capital equipment such as rigs, wellhead equipment, and lease storage, does not necessarily indicate a cut in drilling.

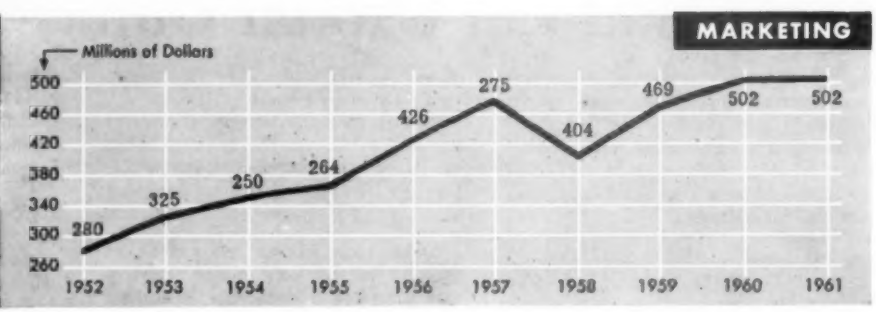
Estimates given PETROLEUM WEEK now indicate that about 52,000 holes, totaling more than 200-million ft., will be drilled in 1960, 2,000 more than are expected to be completed in 1959.

**For the short-term future, at least, the oil industry's capital budgets will reflect a slightly greater emphasis on**










**processing and marketing at the expense of drilling and production.**

Historically, more than 70% of the total industry capital spending has been assigned to the search for the development of reserves.

In the current year, exactly 70% of the over-all capital budget was assigned to drilling and production.

Next year, the indicated ratio will be only 68.5, and a similar ratio is now planned for 1961.

**The emphasis on greater capital outlays for refining and marketing is striking in that the now-scheduled spending in those categories is larger than was planned last spring.**

The industry expects to spend $754-million for processing facilities, including petrochemical plants, in 1960, a 9% gain over the estimated outlays of $692-million this year. Last spring, when the oil industry generally appeared more optimistic in spending plans than now, the programmed capital expenditures for processing amounted to only $670-million for 1960. The now-planned spending is 12.5% higher.

**The lion's share of processing expenditures in the U. S., though, will be for new and modernized units in existing plants—rather than for a significant increase in crude charging capacity.**

Several new processes were developed this year, all of which are designed to provide refiners with more flexibility and efficiency.

**The push for increased marketing**

**outlets by integrated companies as well as independent refiners accounts for the 7% jump in marketing capital expenditures next year.**

Current plans show an industry budget of $502-million for marketing facilities, the highest ever programmed by oil companies.

The outlays planned now for 1960 are 13.8% higher than the estimates of next year's spending that the companies made last spring. And oil companies indicate that another $502-million will be spent for new marketing outlets in 1961—a figure that could be revised upward later.

For the immediate future years, capital spending for marketing promises to be at a higher rate than in past years. That was borne out by the interviews with industry officials by PETROLEUM WEEK in its recent special study of long-term marketing trends (PW—Nov.6'59,p56).

**The expected growth in marketing over the next few years most likely will be followed by a need for a big upswing in the search for and production of crude to fill demand.**

No one regards the present surplus raw material position as a permanent condition.

**Any major upswing in required production will automatically mean a sharp hike in capital spending for drilling and production.**

The primary reason is that during the recent period of surpluses, with producer income held tight, drilling and production has grown gradually, without large gains in capital outlays.

Drilling rigs have been "cannibalized," and other "make-do" practices have been used, to keep expenditures in line with the reduced income level.

One industry expert estimates that about 30% of the approximately 3,400 rotary rigs would require major capital expenditures to make them usable.

**Capital spending by oil companies next year for transportation facilities —excluding natural gas lines—are set at $298-million, unchanged from 1959.**

Since last spring, the programmed spending for 1959 has been trimmed by 10.5%, and for 1960 by 25%.

Over the long haul, however, a growth of markets could bring about a renewed expansion of liquid petroleum tranportation faciiities.

In their spending plans for the next year or two, oil companies plan to operate close to a "cash" basis. The survey of spending plans shows that only 2% of the total capital funds required will be financed outside the industry.

# NOJC: Report Marketing Profits

**The National Oil Jobbers Council has finally committed itself to a march on Washington—if suppliers do not agree to reveal their marketing profits and cut refinery runs.**

After agreeing to hold off such a move last May, the jobbers this fall decided to go to Congress, Federal Trade Commission, or some other government agency to get the action they desire.

The move was prompted in part, at least, by the American Petroleum Institute's failure to comply with a NOJC request to study the marketing profits of integrated companies.

**The jobbers resolved to go to the Federal Trade Commission if the suppliers do not take action to publish "average marketing profit and loss figures for our industry."**

The API has been given 90 days to "employ a competent auditing firm that would maintain secrecy of each company" but publish average marketing profit and loss figures.

"Cost accounting figures are always controversial at best," NOJC admits, "therefore we suggest that API establish a Uniform Accounting Committee to develop methods that will assure an equitable distribution of expenses."

**The jobbers also decided to take the problem of excessive refinery runs to Congress or appropriate regulatory bodies.**

"Unless the refinery segment of the industry take such steps as are legally permissible to effect the necessary reductions within . . . 90 days . . . the officers of NOJC are directed to seek action" through the government, the jobbers resolved.

The jobbers decided on the action in the interest of "conservation, competition, and economic conditions."

**To strengthen their demands, the jobbers decided to withhold support of percentage depletion and intangible drilling cost deductions when those issues come up for hearings in Congress this month.**

The resolution stated that jobber support for those income tax provisions would be given if suppliers can offer proof that the resultant tax savings are not used as a means of "subsidizing" marketing operations.

## Bill Boyd's Death Saddens API Friends

**The death of William R. (Bill) Boyd, Jr., placed a pall over the 39th annual meeting of the American Petroleum Institute this week.**

Boyd, former president and board chairman, died at his Teague (Tex.) farm of a heart attack last Friday, at the age of 74.

His passing came as a shock to the thousands of friends who knew him through his long career with API and as chairman of the Petroleum Industry War Council during World War II.

**Boyd retired ten years ago, ending an API career that began in 1920, shortly after the institute was incorporated.**

He held the offices of president and board chairman from 1941 through 1949. Prior to that, he had been executive vice-president for a dozen years. His first API job was as assistant general secretary and counsel.

The API board passed a resolution expressing regret at "the passing of a man . . . whose record of character, achievement, and patriotism makes oil men proud that he played such an important part in their industry."

Boyd founded the Interdenominational Men's Club of Teague and his family requested that donations be sent to the club in place of flowers.

*Ban on end use control means . . .*

# Gas Sales Will Become More Flexible

**A federal court slap at Federal Power Commission may lead more utilities to buy gas in the field and some producers might enter the transmission business.**

**A court decision that the Federal Power Commission has no business controlling the end use of natural gas could spell some major changes in gas industry operations—if the decision is allowed to stand.**

The U.S. Third Circuit Court of Appeals in Philadelphia last week unanimously threw FPC a curve (PW —Nov.6'59,p18).

**The court ruled that FPC erred in denying permission to Transcontinental Gas Pipeline Corp. to transport to New York gas purchased at the well head by Consolidated Edison Co.**

The commission in January overruled the presiding examiner and decided not to allow the proposed transportation service. The case was appealed by the companies involved.

**Now, with the reversal of FPC, more strictly-transportation contracts between distributors and interstate pipelines could well result.**

FPC has not always taken a hard line against transportation of gas purchased by a company in the field. It allowed Coastal Transmission Co. to transport Texas gas to Florida. And the gas is used to fire boilers, as in the Transcontinental-Consolidated Edison case. But, in the Coastal proposition, it was unlikely the new company could have started business without the transportation contract. FPC also has approved several other pipeline movements of gas purchased by a customer in the field.

**In the Transco case, FPC held that no gas for boiler fuel should be approved when other fuels are available**—except in unusual circumstances. And the commission did not consider the Transco-Con Ed arrangement sufficiently unusual.

The commissioners, in a 4-to-1 ruling, claimed the courts had held end use in the sale of natural gas was a factor for consideration in certification.

Thus, FPC said, end use was a factor in determining the public convenience and necessity.

Observers interpret that the commission in effect tried to tell distributors: "Hands off buying gas reserves—that's for pipelines only."

**But the court slapped FPC down on its policy conclusions.** The three justices agreed that FPC has no authority over the end use of gas—either in sales or transportation.

The opinion by the appeals court took pains to review the Natural Gas Act, the act's legislative history, and judicial interpretations.

The court also noted FPC's frequent recommendations to Congress that the commission be given certain control over the allocation of natural gas. "So far these recommendations have not been adopted," it said.

And the court said FPC made a serious assumption that the proposed use of the gas—as boiler fuel—was "inferior."

**The court denounced FPC's telling distributors to keep out of the pipeline bailiwick.** FPC had argued that to grant the Con Ed service would have led to many similar requests, and the commisison would have had no rational basis for rejecting them.

The appeals court took FPC to task for "denial of the discriminatory process." The commission should make its choice and choose what it thinks are the most important determinative factors, the court said.

FPC also had claimed that field prices for gas would rise with more bidders—distributors—seeking gas reserves.

"Here again is an implicit assertion of authority to conserve and allocate supplies," the court rebuked FPC.

Consolidated Edison bought its gas in place in south Texas, paying a flat 19.25¢ per Mcf. Transcontinental contracted to move the gas to New York for Con Ed at a rate of 23.38¢.

Under the contract, Con Ed could, for up to 60 days a year, interrupt the 50-million cf/d transportation and call on Transcontinental for firm gas for resale out of the pipeline's reserves.

**The reversal of FPC by the court is seen as a blow to coal interests, which oppose boiler use of gas.**

The court not only remanded the case, but ordered a certificate issued. Coal groups had been elated by the Commission's decision, but view the court upset as stunning.

**An appeal to the U.S. Supreme Court is a probability in the case.** FPC, although it conceivably could give up and not seek a review, is expected to try to overcome the appeals court setback. Coal interest would be on FPC's side.

Some commission observers think, however, that one or two FPC members—other than the dissenting John Hussey—might not be too interested in pushing the case.

**The appeals court action is considered by a number of lawyers to be well-written and perhaps "appeal-proof."**

Early reactions from Washington gas attorneys indicate that the Third Circuit opinion might be difficult to upset, that the Supreme Court might not even accept the case.

**If the ruling favoring Transco-Con Ed is upheld, there is even some reason to think that large producers might consider transporting their own gas.**

The legal decision could open the door for producers with sizeable reserves to avoid federal regulatory entanglements by selling their gas to a distributor, or perhaps remain under federal jurisdiction and go into the pipeline business for themselves.

The producers might see some merit in delivering their own gas, some industry men think, to distributors for resale and for direct industrial use.

Reacting to the appeals court ruling, James B. Henderson, vice-president and general counsel of Transco, said:

"We are, of course, quite pleased with the decision of the . . . court. We felt that the Federal Power Commission was wrong in denying our gas transportation arrangement . . . we went to court to prove we were right."

Henderson said his company interprets the ruling to mean that FPC cannot regulate the price of gas sold at the wellhead by a producer to a consumer. "However," he added, "FPC will be able, under the Natural Gas Act, to regulate the price we receive for transporting this gas."

Besides the Transco-Con Ed transportation arrangement, the industry has heard reports of other "transported gas" deals. Southern California Edison Co. has been dickering with Tennessee Gas Transmission for possible movement of gas bought by the California Company in southern Louisiana.

M. J. Rathbone

Henderson Supplee, Jr.

# Rathbone Elected API Chairman

**Hard-hitting Monroe Jackson Rathbone is the new chairman of the board of the American Petroleum Institute.**

Rathbone, president of Standard Oil Co. (N.J.) and vice-chairman of its executive committee, was elected this week to succeed H. S. M. Burns, president of Shell Oil Co.

The usual API procedure is for officers other than the president to serve two one-year terms, the maximum allowable under the bylaws. So Rathbone undoubtedly will be the top officer through 1961.

**Henderson Supplee, Jr., president of Atlantic Refining Co., was named vice-president for transportation.**

Supplee, who has headed the Philadelphia firm since 1952, succeeds Charles E. Spahr, president of Standard Oil Co. (Ohio). Like Rathbone, Supplee will serve through 1961.

**All other officers of the institute, including President Frank M. Porter, were reelected.**

Porter, who owns Fain-Porter Drilling Co., of Oklahoma City has been API's chief executive officer since the spring of 1950. This was his tenth consecutive election.

Reelected with him were: L. E. Fitzjarrald, vice-president of Phillips Petroleum Co., vice-president for production; Clarence H. Thayer, vice-president of Sun Oil Co., vice-president for refining; C. J. Guzzo, vice-president of Gulf Oil Corp., vice-president for marketing; and W. J. Arnold, comptroller of Pure Oil Co., and vice-president for finance and accounting.

# Porter Scorches Coal Campaign

**Frank M. Porter's blistering attack on the coal industry this week set the tone for an all-out oil industry fight against end-use controls of fuels.**

The API president's statement to the 39th annual meeting was the most forthright yet to come from any industry spokesman on this subject.

**Porter bluntly accused coal of having embarked on a "high-powered campaign to reconquer with legislation some of the ground it lost in competition."**

In a major address to the first general session, he declared:

"Though we have seen these campaigns before, we have never seen one quite like this.

"New and different this time is the spirit behind the drive—the unity of the coal industry and its allies, the militancy of their effort, and the apparent determination to fight through to a victory for their side."

What coal wants, Porter went on, is the adoption and enforcement of a national fuels policy which would deliberately exclude natural gas and selected oil products from some of the markets in which they compete with coal.

In other words, he charged, coal hopes to be able to stake out certain markets as its exclusive preserve—where oil and gas would be barred from competing.

**Basically, oil wants no quarrel with coal or any other industry, Porter said. But it is going to fight and fight hard to protect both itself and its consumers.**

That much he made crystal clear. "We must uphold our conviction that these questions should be settled openly in the marketplace through free competition and the exercise of ingenuity and enterprise."

Porter emphasized that oil has no objection to an open-minded, impartial study of the energy outlook in the United States.

"What we are objecting to," he said, "is a study with prejudiced intent, a study that is not meant to serve the public interest or the well-being of the consumers, but rather is intended to advance the self-seeking aims of its advocates."

He questioned whether the coal people would be so zealous in promoting the study if the intent were truly unbiased.

"But the study the coal industry wants, and expects, and is demanding, would be a long step in the direction of 'end-use' controls."

**Oil is particularly bitter about coal's accusation that it has taken a "Fifth Amendment" position.**

Porter noted that a coal spokesman, in a statement to a congressional committee, had made this comment: "In my view, opposition by the oil and gas industries to a national fuels policy study would amount to taking the Fifth Amendment."

**"That is an ugly accusation," Porter said.** "Especially at this time, when 'taking the Fifth Amendment' is closely identified in the public mind with racketeering and fraud.

"The petroleum industry . . . has a fine record . . . one that it is proud of. It has nothing to conceal, and no reason to want to take the Fifth Amendment."

**Porter also urged oil men to exercise more thought in relating refinery operations to market demand.**

"Proper operation of these plants should include something more than just jamming every possible barrel of crude through them," he commented.

"Shouldn't it, at least, further include a responsible knowledge and awareness of the markets to be supplied and the economic conditions existing?

"Apparently there is a lack of communications somewhere."

POLITICS AND OIL were mixed by API President Frank Porter, Imports Administrator Matthew V. Carson, Jr., and Gov. J. Howard Edmondson of Oklahoma.

EARLY REGISTRANT: Howard Vesper, Standard of California.

# The Annual Get-Together: Oil Men

TWO CONTRACTORS, A. W. Thompson, Houston, and Harry W. Bass, Dallas, discuss the drilling business.

SIGNED UP: Two Houstonians, Millard Neptune of Texas Eastern Transmission and Howard Book of Reed Roller Bit.

SHELL OFFICIAL M. E. Spaght, New York, completes his registration card.

BOARD SESSION: API directors W. W. Flenniken, Denver; and Charles A. Perlitz, Jr., Continental Oil, Houston, hold a lobby committee meeting.

SURVEYING THE SCENE: J. G. Coates, of Gulf Oil Corp., Houston.

IPAA OFFICIALS L. Dan Jones, Washington counsel; Gordon Simpson, of Dallas, retiring president; and Executive Vice-President Minor Jameson, Jr., of Washington.

# Renew Old Acquaintances in Chicago

CROSS COUNTY oil men: D. L. Connelley, Warren Petroleum, Houston; J. P. (Dick) Jones, Bradford, Pa., and John McMillan, Monterey Oil, Los Angeles.

CANADIAN OIL MAN Charlie Hay, president of Royalite Oil, Calgary.

ORGANIZATION TALK: Perry Peterson, Cities Service, New York, meets Carl Mattern, OCAW organization director.

OLD TIMES are discussed by Charles J. Reller, Atlantic Refining, and W. L. Connelly, Tulsa, oil's pioneer of pioneers.

CONCEN-
TRATION

Concentration on the needs and requirements of the oil producer — careful, expert attention to the demands of modern production financing — these are reasons why Republic is a leading oil bank of the South — with the South's largest Oil Department. How may we serve you?

REPUBLIC NATIONAL BANK
OF DALLAS

CAPITAL AND SURPLUS
$100,000,000
LARGEST
IN THE SOUTH

MEMBER
F.D.I.C.

# What's New / IN THE INDUSTRY

**Utah Southern Oil Co. is planning to sell its assets to Texas National Petroleum Co., of Houston, for $19.2-million.** A stockholders' meeting has been called for Dec. 21 to decide whether final approval will be given to the directors' proposal. Utah Southern owns producing properties in the Rangely field of Western Colorado and the Garland field in the Big Horn Basin of Wyoming. If the sale is approved, Utah Southern's 1.2-million stockholders will be paid about $16 a share.

•

**Three more companies have filed suits to test Texas' new "severance beneficiary" tax on natural gas.** They are Northern Natural Gas, Panhandle Eastern Pipe Line, and Transcontinental Gas Pipe Line. First suit was filed by Michigan Wisconsin Pipe Line three weeks ago (PW—Oct. 23'59, p6).

•

**Petroleum and other conventional fuels will be major sources of power for years to come.** That's the conclusion of several speakers at Columbia University's "Energy and Man" seminar last week. Dr. Edward Teller, the noted physicist, said nuclear explosions hold the greatest promise for future energy sources, but that petroleum and petrochemicals will have to supply mobility needs for years, "maybe for centuries yet." Other speakers included Herbert Hoover, Jr.; Allan Nevins, Pulitzer Prize historian; Prof. Edward S. Mason of Harvard; and Robert G. Dunlop, president of Sun Oil Co.

•

**Stronger control over common-carrier oil pipelines is needed by producing states.** So says John Davenport, general counsel of the Texas Independent Producers & Royalty Owners Assn. He told an Albuquerque (N. M.) group that "when a state grants pipelines the right of eminent domain, it is not too much to require common-carrier responsibilities."

•

**The hearing on Richfield Oil Corp.'s fight against its designation as a public utility has been postponed until Dec. 3.** The company has appealed to the State Supreme Court to invalidate a Public Utilities Commission ruling that it is a public utility because it sells natural gas to Southern California Edison Co., and Pacific Lighting Gas Supply Co. Meanwhile, Standard Oil Co. of California petitioned the court for permission to file a brief supporting Richfield's position that sale of gas to a public utility doesn't make it a utility.

•

**A consent decree has eliminated Lehman Bros., of New York, from Texas' antitrust suit against it and Sinclair Oil.** Attorney General Will Wilson filed the suit last January to halt the proposed merger of Sinclair and Texas Pacific Coal & Oil. He contended Lehman, Sinclair, and others acted "in concert" to acquire $40-million worth of Texas-Pacific stock to pave the way for the merger. The consent decree enjoins Lehman from further participation and orders it to divest itself of its Texas-Pacific stock within 120 days.

•

**API's centennial edition of Petroleum Facts & Figures is now available.** The 475-page volume provides a comprehensive statistical history of the first 100 years of oil. It incorporates, for the first time, historical highlights on each of the industry's major divisions, a glossary of important terms, and a bibliography.

"...pacing the pipeline construction industry
for more than a quarter century"

price tower

PIPELINE
H·C·PRICE·CO
CONSTRUCTORS

bartlesville, oklahoma

# Looking Ahead in Washington

McGraw-Hill
Washington
Bureau
November 13, 1959

**Independent producers are weighing the possible effects of "area price" gas regulation on any future gas bill.** Indications that the Federal Power Commission may adopt field ceilings on gas prices are stirring producer interest. Spokesmen for some larger producers are cool to the idea of area, or field, pricing, for fear the controls will still be stiff and may hamper chances for passing a gas bill which would ease regulation.

**Other producers are biding their time to see exactly what type of field price control—if any—might be used.** "For example," says one Washington producer representative, "FPC might set those field ceilings on the basis of costs. Then we still might have the same conflicts over what factors are included in costs."

**Federal Power Commissioner William R. Connole has endorsed an area approach to pricing, but only if prices are based on costs.** An area method was first proposed by Commissioner Frederick Stueck, but no mention was made at the time of a cost basis. Connole would limit field prices—after an area cost study is made—to "something like 75% of the top price in a given area."

**Would field price ceilings split the ranks of producers?** Many smaller producers, unlike some larger producing companies, might be willing to accept a system of field pricing—mainly to avoid the administrative woes at FPC. But all seem to agree that field prices would remove much of the delay, confusion, and backlog at the commission.

**Some gas bill backers foresee opponents using field prices as a "wait and see" tactic.** If FPC does indeed adopt the field ceilings, and the industry sees a gas bill as a continued necessity, there is a fear that political foes might use FPC's new approach to convince Congress to delay enactment of gas legislation.

•

**Oil and gas issues already are being tossed into the 1960 Presidential nomination campaigns.** Note that Sen. Paul Douglas (D., Ill.), consistent petroleum industry opponent, is saying Senate Majority Leader Lyndon Johnson (D., Tex.) would be unacceptable as Democratic nominee for President. One of the main reasons, Douglas says, is Johnson's stand on oil and gas issues—such as depletion and federal regulation of producer prices. Political friends of Johnson agree that his petroleum voting record may hurt him among northern Democrats, but say he may be able to overcome the opposition in the event of a convention deadlock.

•

**The Internal Revenue Service has up for decision a rules-tightening on business expenses.** It wants more definite control in the areas of advertising, public relations, and lobbying. Hearings are being held this week.

**Business groups—and labor, too—are opposing the proposed new regulation.** They particularly dislike the broad language: "Expenditures for lobbying purposes, for the promotion or defeat of legislation, for political campaign purposes (including the support of or opposition to any candidate for public office), or for carrying on propaganda (including advertising) related to any of the foregoing purposes are not deductible from gross income."

# 2nd in Sales –

# – and moving UP!

SECURITY rock bits continue to make sales history. That's because with Security bits you get the *right* design, metallurgy, construction – advantages that permit you to drill deeper, faster, with longer bit life.

Choose from Security's complete line of rock bits – more than 1120 types, sizes, variations – *the right bit for every job.* Ask a Security representative for the facts that make Security the first choice for drilling economy. Write for Security's rock bit catalog – and before you drill the next well, get the facts about Security bits. Like thousands of other oilmen, you'll save when you depend on Security.

**Security**

*PRECISION BITS SINCE 1931*

Available Through Your Favorite Accredited Supply Store

PLANTS...Dallas, Texas; Whittier, California; Manchester, England
SECURITY ENGINEERING DIVISION...3400 W. Illinois, Dallas, Texas
EXPORT OFFICE...Post Office Box 13647, Dallas, Texas
CANADA...Security Engineering Canada, Ltd., Edmonton, Alberta, Canada
OVERSEAS...Security International C. A., Caracas, Venezuela; London, England

# For Production: Big Growth Ahead If...

- **A New York financial analyst predicts better times ahead, provided refinery runs are more "realistic," and all possible economies are effected.**
- **He also sees capital expenditures for production topping $50-billion in the decade through 1968.**

**The petroleum industry will have to spend from $50-billion to $55-billion in capital expenditures for production by 1968 to meet growing demand, a New York financial analyst predicts.**

Donald K. Russell, of Lehman Corp., made the prediction this week in a talk before the meeting of the Production Section at the American Petroleum Institute's annual convention in Chicago.

**The "vigorous growth" forecast for the decade is based on the expanding use of all petroleum energy, including gas, oil, and gas liquids.**

Russell told the oil men that "you cannot expect anything as good as the first ten post-war years, through 1955, but you can expect something much better than the ten years ended with 1958."

The analyst forecast that the growth in gas demand will be a key factor in the over-all growth of petroleum energy.

**To obtain total demand for petroleum energy, he continued, we must add the oil-equivalent of marketed gas to the customary figure of demand for oil and gas liquids.**

On the basis of equivalent energy content, 1 bbl. of oil equals 5,604 Mcf of gas, the U.S. Bureau of Mines estimates. Using this figure, Russell said, last year's marketed gas production of 11-trillion cu. ft. is equivalent to nearly 2-billion bbl. of oil—which averages out to about 5.4-million b/d, against last year's crude production of 6.6-million. He added that "our 1968 forecast indicates that gas and gas liquids will then provide 10-million b/d of oil equivalent, or 46% of total petroleum energy."

Russell predicted that domestic sources will provide 88% of the petroleum energy required in the U.S. in 1968.

**Total petroleum hydrocarbon demand will reach 21.7-million b/d by 1968, he predicted, reflecting a growth rate of 4.2% per year.**

The gain in barrels per day will be about 7.3-million, "of which somewhat less than half (3.4-million b/d) will come from marketed gas production, and somewhat more than half (3.9-million b/d) from oil and liquids."

He said that marketed gas production, projected at a growth rate of 5% per year, will reach about 18-trillion cu. ft. in 1968—"unless the domestic finding effort is crippled by inadequacy of revenues."

The increase of 3.9-million b/d in domestic oil and gas liquids demand by 1968, Russell said, indicates a 3% annual rise in domestic crude production. This would give an average yearly increase of about 250,000 b/d, compared with 119,000 b/d in the past ten years.

The growth in crude production would total 2.5-million b/d for the decade, bringing production to 9.2-million b/d by 1968.

**Oil reserves will need to be increased by 20% and gas reserves by 50% in the current decade, he added, if the increased demand for petroleum energy is to be met.**

Russell said a gross addition of 36-billion bbl. of oil will be needed through 1968. This would result in total reserves of 37-billion bbl. as of 1968 after deductions for production of 29-billion to 30-billion bbl. in the decade. The addition of 36-billion bbl. compares with 30-billion bbl. of reserves added in the past ten years. Reserve life in 1968 would be about 11 years, on the basis of 9.2-million b/d of production.

Gas finding also will have to be stepped up, to an average of 25-trillion cu. ft. yearly, compared with the 17-trillion in the past decade. The new additions will give a ratio of reserves to production of 19 years, compared with the 22 at the end of 1958.

**To obtain the necessary funds for capital expenditures, total wellhead income will have to increase by 5.8% per year, the analyst said.**

"Our 1968 projections of volumes and prices leads us to total wellhead income of $16.5-billion, an increase of $7.1-billion over 1958 (table, below).

"As a percentage figure for the relation of capital outlay to wellhead revenue, we have chosen a conservative 43%, comparing with 39% in 1958, and 35% in 1948, thus reflecting higher costs." And 43% of $16.5-billion means a 1968 capital expenditure of $7.1-billion.

On this basis of calculation, Russell estimated that the petroleum industry would spend from $50-billion to $55-billion for capital uses in the current decade, compared with $34-billion in the past ten years.

**An increase in the price of crude**

## Domestic Wellhead Prices per Barrel

| | Gas | | Oil | Gas Liquids |
|---|---|---|---|---|
| | Per Mcf | Per Bbl.* | | |
| 1938 | 4.9¢ | $0.27 | $1.13 | $0.90 (a) |
| 1948 | 6.5 | 0.36 | 2.60 | 3.11 |
| 1958 | 11.9 | 0.67 | 3.01 (b) | 2.29 (est.) |
| 1968 (est.) | 19.0 | 1.06 | 3.50 | 2.80 |

* marketed gas production is converted to oil equivalent on the BTU basis of 5,604 cu. ft. = 1 bbl. No adjustment is made for differing thermal efficiencies of gas and oil burners.
(a) Arbitrarily taken at 80% of crude.
(b) Now about $2.89.

## Wellhead Value vs. Capital Outlay

| | Value of total hydrocarbons at wellhead (millions of dollars) | Capital expenditures for production (millions of dollars) | Expenditure as % of value | Capital expenditure per bbl. of production |
|---|---|---|---|---|
| 1938 | $ 1,534 | —— | —— | —— |
| 1948 | 6,039 | $2,100* | 34.8% | $0.68 |
| 1958 | 9,357 | 3,650* | 39.0 | 0.78 |
| 1968 (est.) | 16,453 | 7,075 | 43.0 | 1.01 |

* Estimated by Chase Manhattan Bank.

# GET THE MOST

THE MISSION VALVE THINKS FOR ITSELF
TO SEAL AUTOMATICALLY

**Not only is the Mission Valve** always ready to seal, but the higher the pressure the tighter the seal. Line pressure forces Mission sealant through two semi-circular grooves around the downstream port, sealing like a plastic packing, to form a gas tight seal. Leaks are stopped *automatically* before they start. **The complete line** of 315 Mission Valves brings the positive advantages of easy opening and tight sealing to practically all valve applications. This wide selection, the Mission Guarantee, and the Mission Renewal Policy combine to make Mission Valves your best buy. Specify Mission and eliminate your valve problems.

MISSION
VALVE AND PUMP CO.

MISSION VALVE AND PUMP CO. *a subsidiary of* MISSION MANUFACTURING CO.
*P. O. Box 4209, Houston, Texas cable address* "MISSCO" • *export office: 30 Rockefeller Plaza, New York*

# HUDSON Combin-aire

**LOW TEMPERATURE COOLING USING COMBINATION OF MINIMUM WATER AND MAXIMUM AIR**

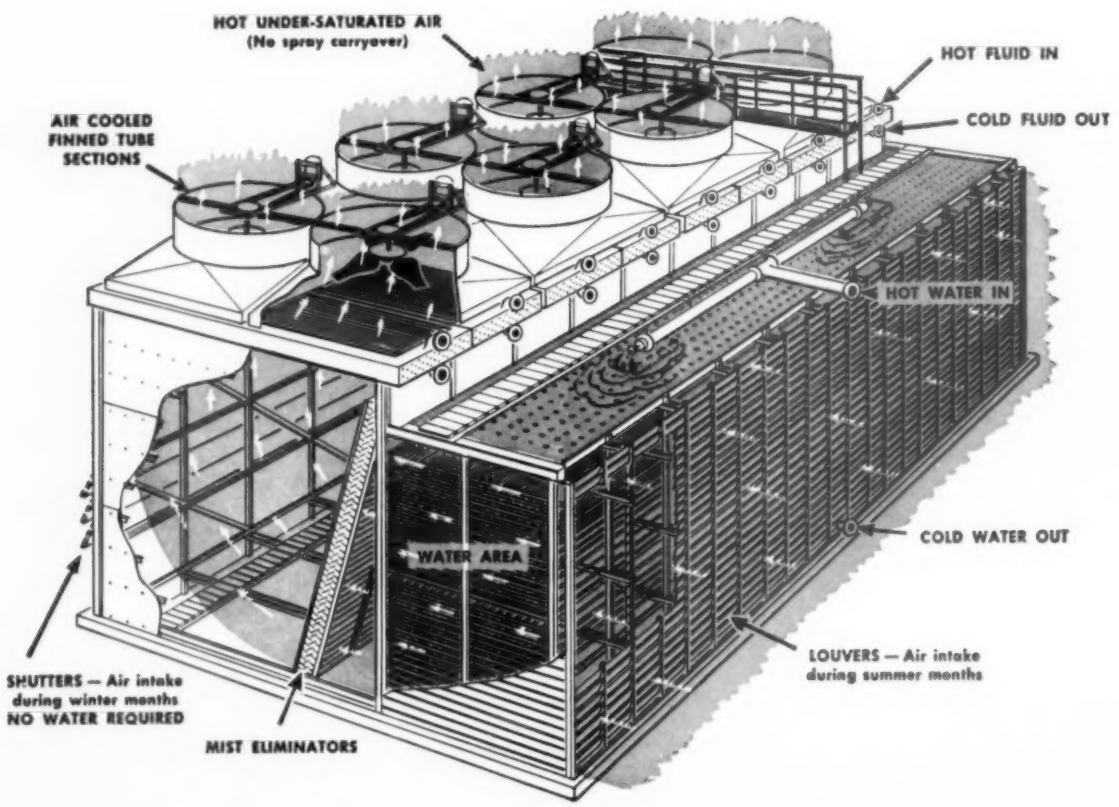
In recent years Hudson Solo-aire cooling in which only air is used as a cooling medium has been installed by the world's largest refineries. In recent cases of three separate 40,000 barrel complete refineries in locations where unlimited water is accessible Hudson Solo-aires are used for *all* process cooling.

So that air could be used for cooling those process streams requiring lower terminal temperatures than obtainable with ambient summer air temperatures, Hudson developed and in 1949 installed the first Combin-aire cooling unit. Since that time Combin-aires have proven their worth in installations for over 80 services in major refineries, chemical plants and gas processing plants in the United States, the Middle East, Europe, Mexico and South America.

In Combin-aire cooling, high temperature ambient air is first pre-cooled by direct contact with water, the cooled air then becoming the low temperature cooling medium for fin-tube elements. Cooling of air, and subsequent use of the cooled air for fin-tube cooling of process streams, are effected in one integrated structure — the Combin-aire.

**Cooling with Combin-aire to overcome the occasional limitation of high ambient temperatures has the following advantages:**

- **Absolute minimum water consumption consistent with attainment of low terminal process stream temperatures.**
- **Water circulation may be made automatically responsive to air temperatures with no water circulated except at high ambient temperature.**
- **No water treatment necessary. Salt water or brackish water may be used.**
- **No spray carryover or condensation. After passing across the fin-tube elements the heated air leaving the Combin-aire at elevated temperature is undersaturated with water vapor and cannot precipitate condensate or carry water spray.**
- **Minimum piping. Combin-aire may be installed immediately adjacent to other process equipment.**
- **Clean air to fin-tube units. During the hot season air is washed, removing dust, sand and insects.**

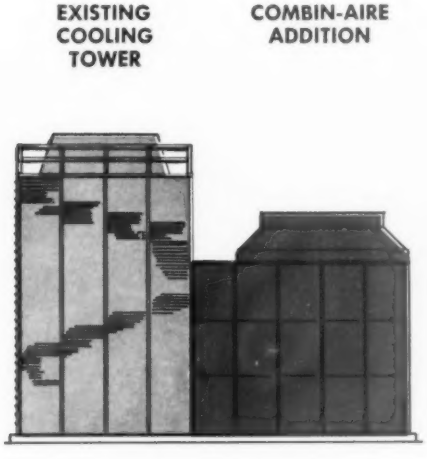

HOT UNDER-SATURATED AIR
(No spray carryover)
HOT FLUID IN
COLD FLUID OUT
AIR COOLED FINNED TUBE SECTIONS
HOT WATER IN
WATER AREA
COLD WATER OUT
LOUVERS — Air intake during summer months
SHUTTERS — Air intake during winter months NO WATER REQUIRED
MIST ELIMINATORS

When Combin-aires are installed as adjuncts to cooling systems using existing shell and tube or other water cooled equipment the cooled water from the bottom of the Combin-aire may be used in such equipment. The Combin-aire then takes on the additional function of a water cooling tower with, however, the advantages over conventional cooling towers of dual use of both air and water and elimination of water spray carryover and condensate precipitation.

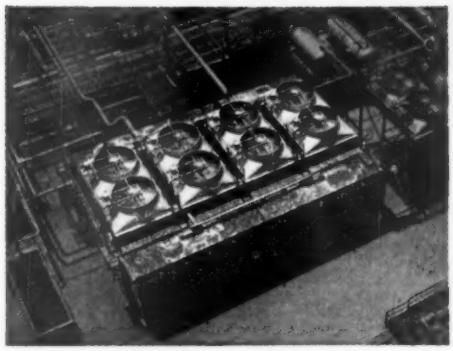
In over 80 services and under a wide range of atmospheric operating conditions Combin-aire units have amply fulfilled performance and mechanical specifications. Before proceeding with a new process unit or revamping or adding to present cooling systems let Hudson give objective assistance in determining the most economic balance in the use of air cooling, Combin-aire cooling and water cooling.

## CONVERTING COOLING TOWERS INTO COMBIN-AIRE UNITS

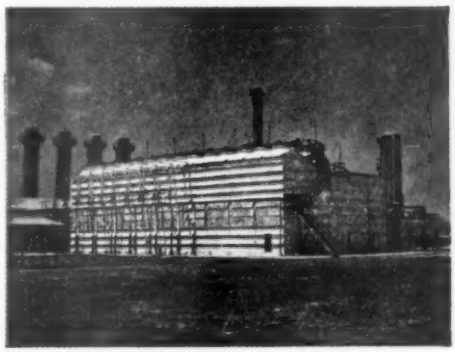
Presently installed cooling towers may be used as the basis for Combin-aire cooling by installing structure with fin-tube elements and fans immediately adjacent to the cooling tower with air for the fin-tube elements being drawn across the water near the bottom of the cooling tower, thus increasing the capacity of the cooling tower, and cooling the air for use in the fin-tube elements.



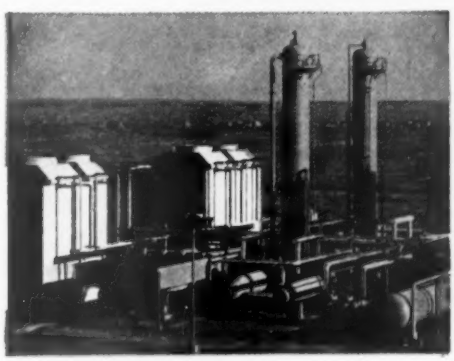

Combin-aire is protected by U. S. Patents, Patents pending and copyrights.



**TEXAS —**
**COSDEN PETROLEUM CORPORATION**
**Big Spring, Texas**



**MEXICO —**
**PETROLEOS MEXICANOS**
**Reynosa, Tamaulipas, Mexico**



**PAKISTAN —**
**PAKISTAN PETROLEUM, LTD.**
**Sui gas field, West Pakistan**

**HUDSON**
**ENGINEERING CORPORATION**
FAIRVIEW STATION • HOUSTON, TEXAS

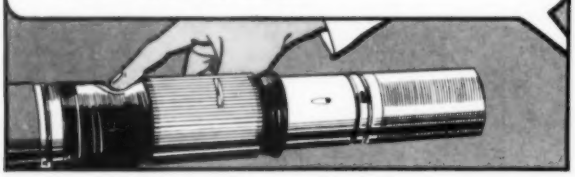
SALES OFFICES:
9935 Santa Monica Blvd. Beverly Hills, California • 122 East 42nd St. New York, 17, N. Y. • 199 Bay Street Toronto, Ontario, Canada
17 Stratton St., Picadilly London W. 1, England • Corrientes 1115 Buenos Aires, Argen. • Rua Mexico 45 Rio de Janeiro, Brazil

HUDSON COOLING EQUIPMENT MANUFACTURED UNDER LICENSE BY:
A. F. Craig & Co., Ltd. Paisley, Scotland • Batignolles-Chatillon 5 Rue de Monttessuy Paris, France

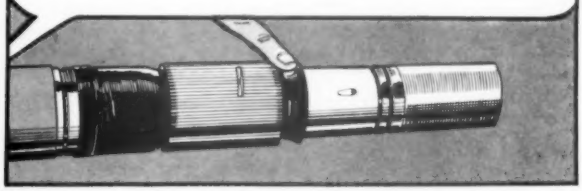
## HERE'S A REPORT ON THE DURABILITY OF THE RUBBER-TYPE ELEMENTS USED IN OUR TYPE OF GAS LIFT VALVES — AND HOW THE DESIGN PRINCIPLE SAVED A SOUTH TEXAS WELL OWNER THE COST OF A CONVERSION WORKOVER.

THE VALVES COVERED BY THIS REPORT HAVE BEEN IN THE WELL FOR 5 YEARS NOW — AND HAVE GIVEN PERFECT SERVICE. WHAT'S MORE, THEY SAVED THE OPERATOR THE COST OF A WORKOVER JUST THREE MONTHS FOLLOWING INSTALLATION, WHEN THE WELL HAD TO BE CONVERTED FROM CONTINUOUS TO INTERMITTENT LIFT. THE WELL HAS BEEN PRODUCED INTERMITTENTLY SINCE THAT TIME AND THE WELL OWNER IS PLEASED WITH THE OPERATION OF THE VALVES.

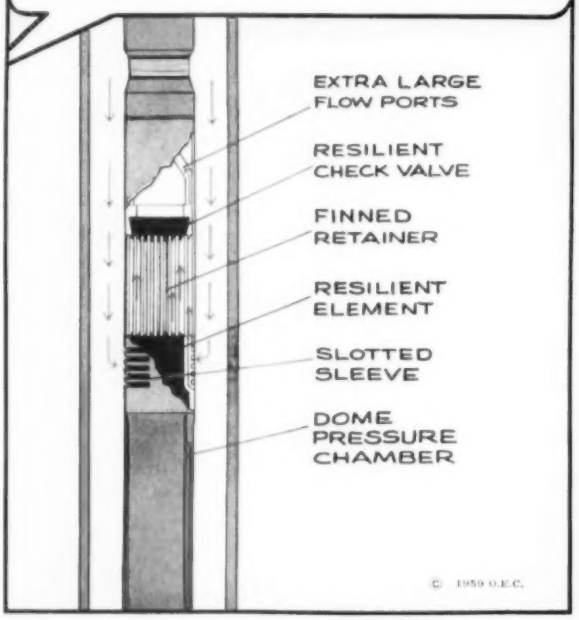
HERE, LET ME SHOW YOU THE MANY ADVANTAGES OF THE RESILIENT ELEMENTS IN OUR VALVES. FIRST, BECAUSE THIS MAIN ELEMENT IS RESILIENT, IT RESISTS EROSION FROM THE SYSTEM GAS. SECOND, THE FLOW AREA ACROSS THE ELEMENT IS THE LARGEST FLOW AREA OF THE VALVE, WHICH NOT ONLY HELPS TO REDUCE ANY CUTTING ACTION FROM THE SYSTEM GAS BUT MINIMIZES THE MOVEMENT REQUIRED TO ADMIT GAS FROM THE ANNULUS DURING OPERATION. THESE FEATURES ARE DESIGNED TO PREVENT FATIGUE.



THE SAME PRINCIPLES APPLY TO THE CHECK VALVE HERE. IT COMPRESSES JUST SLIGHTLY AS GAS PASSES OVER IT, THEN — WHEN NECESSARY TO CHECK BACK PRESSURE FROM THE TUBING — IT FORMS A BUBBLE-TIGHT SEAL AGAINST THE FINNED RETAINER AND INSIDE WALL OF THE VALVE. AND THE RUBBER-TO-METAL SEAL PRINCIPLE OF BOTH RESILIENT ELEMENTS ELIMINATES THE EXCESSIVE WEAR NORMALLY ASSOCIATED WITH METAL-TO-METAL, STEM-AND-SEAT TYPE VALVES.

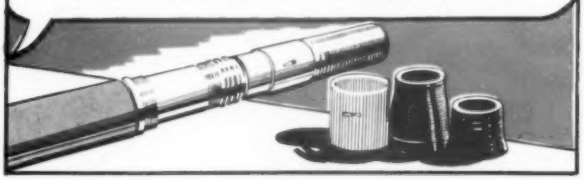


I'LL SHOW YOU HOW WE BOND THE MAIN VALVE ELEMENT TO THE VALVE MANDREL ASSEMBLY IN A MINUTE — BUT FIRST LET ME SHOW YOU THIS FLOW DIAGRAM OF OUR TYPE C GAS LIFT VALVE. PRESSURE FROM THE VALVE DOME HOLDS THE MAIN VALVE ELEMENT CLOSED ACROSS THE SLOTTED PORTS. WHEN GAS PRESSURE IN THE ANNULUS EXCEEDS THE SET PRESSURE OF THE VALVE, THE MAIN VALVE ELEMENT OPENS. WHEN THE PRESSURE FROM THE ANNULUS DROPS BELOW THE SET PRESSURE OF THE VALVE, THE VALVE CLOSES.




© 1959 O.E.C.

NOW HERE'S HOW WE BOND THE MAIN VALVE ELEMENT TO THE VALVE MANDREL ASSEMBLY. FIRST WE SERRATE THE SEALING SURFACES OF THE MANDREL ASSEMBLY TO GIVE IT A SUPERIOR BONDING SURFACE. THEN WE APPLY A SPECIAL BONDING CEMENT, SLIP THE RUBBER ELEMENT INTO PLACE, AND BAKE THE COMPLETE ASSEMBLY FOR ONE HOUR AT 375° F. THIS PRODUCES A PRESSURE-TIGHT SEAL AT THE ELEMENT END OF THE DOME CHAMBER. AS A RESULT, OUR VALVES CAN BE EXPECTED TO MAINTAIN THEIR SET PRESSURE INDEFINITELY.



IF YOU'RE PLANNING A NEW GAS LIFT INSTALLATION AND WANT TO **RUN VALVES THAT WILL STAY IN THE HOLE** AND GIVE YOU TROUBLE-FREE SERVICE — **INSTALL OTIS GAS LIFT VALVES.** THEY HAVE NO METAL MOVING PARTS . . . NO BELLOWS TO FATIGUE . . . NO METAL SEATS TO CUT OUT . . . AND THEY'RE DESIGNED TO OPERATE CONTINUOUSLY OR INTERMITTENTLY WITHOUT HAVING TO BE PULLED FOR CONVERSION. CONTACT ONE OF OUR GAS LIFT SPECIALISTS AT THE OTIS OFFICE NEAREST YOU. HE'LL BE GLAD TO SHOW YOU THESE AND OTHER EXCLUSIVE FEATURES AND EXPLAIN HOW OTIS GAS LIFT VALVES ARE DESIGNED TO SAVE YOU MONEY.

*Otis - "First in Gas Lift Control"*

OTIS

**OTIS ENGINEERING CORPORATION**

General Offices: 6512 Denton Drive Dallas

*Branches Throughout the Oil Country*

**to $3.50 per bbl. and gas to 19¢ per Mcf, will be necessary to obtain the wellhead revenue required for new capital, the analyst said.**

Russell cautioned that "perhaps in the absence of a new gas act, gas prices will continue below their economic level. But they nevertheless must rise in this decade."

He said the rise to 19¢ per Mcf for gas would be an increase of 7¢ per Mcf for the decade, compared with a rise of 5½¢ per Mcf in the past decade (table). He noted that the old low-priced contracts will expire and new higher-priced contracts will take their place. "Therefore," he continued, "our projected revenue increase from gas is $2.1-billion, out of $7.1-billion required . . . gas liquids will yield an increase of about $600-million.

"That leaves oil to provide $4.4-billion. Rising production at the niggardly rate of recent years might provide $1.1-billion, based on a ten-year increase of 100,000 b/d per year taken at $3 per bbl.

"Tight import controls are clearly essential. With them we might increase production 250,000 b/d per year and gain $2.75-billion of revenues. Even then we would be $1.65-billion short of the revenue needed."

Therefore, he continued, an increase in the crude price of $3.50 per bbl. would be necessary to reach the required sum. This price will be reached, he noted, if the rise in crude prices equals an estimated 2% yearly advance in the general commodity price index.

**Crude prices cannot rise, however, if there are to be "recurring price shambles in products, due to excessive refinery runs," he warned.**

Russell noted that the 1959 outlook seemed promising until refiners, "forgetting the severe readjustments of 1958, proceeded as usual to give only token heed to seasonality, and to cultivate the incremental barrel."

Russell conceded that higher refinery runs—the incremental barrels—tend to reduce refining costs more than proportionately. But, he added, the benefits are negative when burdensome product stocks result—as in 1956-58 and again this year.

"If excessive refinery runs reduce costs by 5¢ a bbl.," he said, "the refiner may lose 20¢ or 25¢ a bbl. through resulting price declines—apart from what he may lose in evaporation losses and carrying charges.

"The outsider cannot understand runs out of season, runs that might be called 'sinkremental' barrels because they sink the good hopes of the domestic industry, as they certainly did this year."

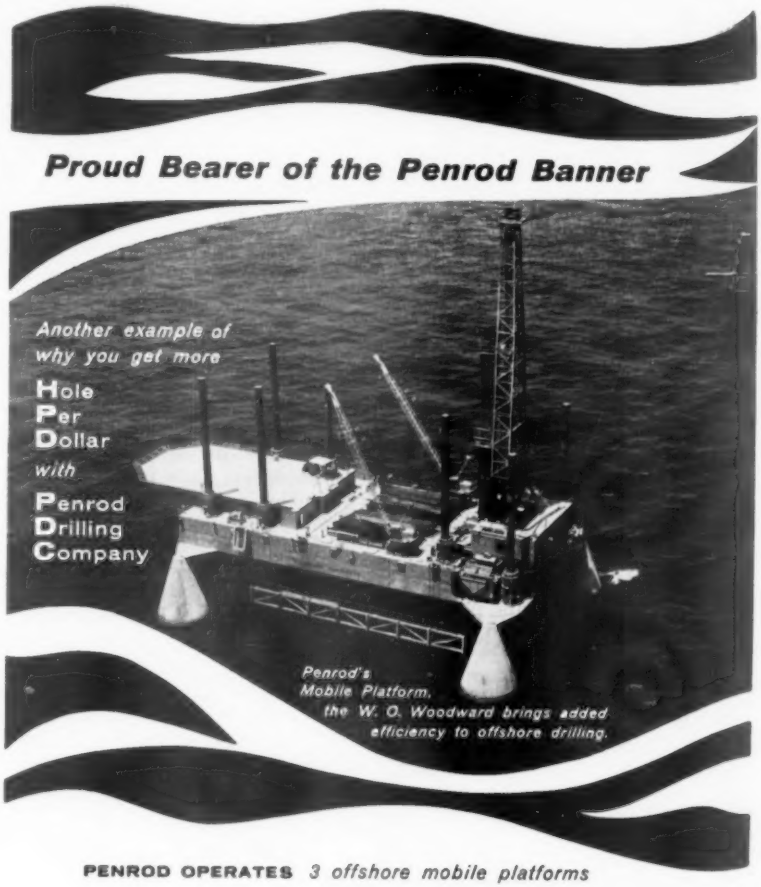
Russell suggested that a reduction of 5% below what the refining industry normally plans "would make the difference between a livable situation and the recurrence of intolerable situations—intolerable, we believe, to the industry, to its stockholders, and to the national interest.

**Producers will have to use their capital funds wisely, he warned. They must "hold down development costs not needed for producibility."**

Under the lease and royalty set-up, Russell said, a discovery of marginal quality can set off a whole cahin of developement, through required offsets.

He added that the reduction of allowables in Texas means that existing wells, apart from exempt production, can produce at most efficient rates more than twice their allowables."

But offset requirements must be met, he continued, and with allowables declining, there is a strong pressure to develop for production, to get the allowables that go with additional wells. Such development adds huge amounts to capital expenditures each year.



Proud Bearer of the Penrod Banner
Another example of why you get more
Hole Per Dollar with Penrod Drilling Company
Penrod's Mobile Platform, the W. O. Woodward brings added efficiency to offshore drilling.

PENROD OPERATES *3 offshore mobile platforms*
*6 inland barges — 16 land rigs*

*Drilling to Any Depth with* **PREMIUM EQUIPMENT**
**EXPERIENCED PERSONNEL**

Call, wire or write:

**PENROD**
**DRILLING COMPANY**
J. P. (Jack) Johnson, Drilling Superintendent

PENROD LAND AND SEA DRILLING COMPANY

HOME OFFICE:
1320 MERCANTILE SECURITIES BLDG. DALLAS 1, TEXAS Riverside 7-1507
DIVISION OFFICE: POST OFFICE BOX 508 HOUMA, LOUISIANA UPtown 9-1521

The NEW REDA "450" SERIES PUMPS

provide more oil per dollar invested

- 250-600 B.P.D.
- 900-4,400 Ft. Lift
- For 5½" or larger Casing Sizes

The new REDA "450" Series Pumps will REDUCE your lifting costs, and provide ECONOMICAL, DEPENDABLE performance.

- LOW INITIAL COST
- AUTOMATIC OPERATION
- LOW OPERATING COST
- LOW MAINTENANCE REQUIRED
- CORROSION-RESISTANT CONSTRUCTION

WRITE TODAY FOR REDA R-450 BULLETIN!

LARGER PUMP SIZES AVAILABLE

SIGN OF QUALITY OILWELL REDA PUMPS

REDA PUMP COMPANY
BARTLESVILLE, OKLAHOMA
Manufacturers of Submergible, Electric Motors and Pumps for Over 35 Years.

*Arkansas' first . . .*

# Quad Completion Unique

**Athletic Mining & Smelting Co. has come up with some novel techniques in completing the first quadruple well in Arkansas.**

The well, Athletic et al No. 1 Ernest Carpenter, section 23-8n-27w, Franklin County, was completed recently from four separate Atoka (Pennsylvanian) sands in Aetna gas field.

The new producer, a zone discovery from the upper two zones, is in northwest Arkansas' promising McAlester (Arkansas River) Basin (PW—Feb.6 '59,p21).

In addition to AM&S as operator, ownership in the well is held by Continental Oil Co., Carter Oil Co., and Stephens Production Co. The latter company also is headquartered in Ft. Smith.

**The rather unorthodox method of completion involves producing gas from two zones through annular spaces, and from the other two zones through tubing.**

When initial drilling got down to 832 ft., 13-in. surface pipe was landed on bottom and cemented solid with 500 sacks. The contractor then drilled out with a 12-in. hole that was carried to total cable-tool depth.

When the cable tool reached 2,255 ft., 10-in. casing was run and tail-cemented with 65 sacks. This left the producing interval from 1,740-93 ft. free of cement, allowing it to be produced through the annular space between the 13-in. surface pipe and the 10-in. intermediate string.

Next, operator drilled ahead to 4,106 ft., where 8⅝-in. liner was run and cemented solid from 2,210-4,106 ft.

The hole then was drilled ahead to total depth of 7,355 ft., and 5½-in. liner cemented from 3,934-7,130 ft. Plugged back total depth is 7,215 ft.

After final liner had been cemented, the operator perforated the 8⅝-in. liner from 3,440-88 ft. in the Lower Carpenter, opening that zone to production through the annular space between the 8⅝-in. liner and the 10-in. string.

Perforations then were effected in the 5½-in. liner opposite the Cecil and Orr formations, and parallel tubing strings run. Packers were placed so that the two zones could be produced separately.

**The quadruple's four pays, the producing interval of each, and their respective open-flow rates are:**

- **The Upper Carpenter, producing from open formation between 1,740-93 ft., made 1.8-million cf/d of gas** on initial test through annulus. Shut-in surface pressure registered 573 psi.

- **The Lower Carpenter, perforated between 3,440-88 ft., flowed 5-million cf/d,** with shut-in pressure of 870 psi. Production is through the annulus.

- **The Cecil, with perforated interval at 6,030-47 ft., flowed 440,000 cf/d.** Flow was through 2-in. tubing, and surface pressure registered 1,090 psi.

- **The Orr, with perforations at 6,791½-827 ft., flowed 4-million cf/d** through 2-in. tubing. Shut-in pressure was 1,559 psi.

Each of the potential gauges was based on four-hour test. Total calculated open-flow potential on this basis is 11,640,000 cf/d.

**Top flow from two of the zones will not be realized for some months, says Roger Planalp, of Athletic.**

The two lower sands, the Cecil and the Orr, received acid Petrofrac treatments prior to potential tests. At the time of the tests, much of the fracturing fluid remained in the formations, effectively restricting their flows.

**AM&S drilled part of No. 1 Carpenter with cable tools, then moved in a rotary.**

This practice, fairly common throughout northwest Arkansas, is followed because of unusually hard formations at depths down to about 3,000 ft. Once rotaries are moved in, water-bearing upper zones usually are

# It couldn't be done without the RUBBER SLEEVE Core Barrel

## Complete core recovery, even in soft, unconsolidated or fractured formations

Just over a year ago, Christensen Diamond Products Company introduced an entirely new concept in core packaging to the oil industry . . . the Rubber Sleeve Core Barrel.

Since that time, many formations that were formerly difficult or impossible to core, have been cored successfully with the rubber sleeve core barrel.

This rubber sleeve barrel actually encases the core in a protective rubber package, which reduces contamination to a minimum and eliminates many of the bridging, crumbling and jamming problems encountered with conventional barrels.

The rubber-packaged cores are ideal for handling and shipping and can be easily stored without altering the physical or fluid content, thus eliminating the need for freezing or canning of cores.

And now, laboratories have developed techniques which enable them to obtain accurate reservoir information without removing the core from the rubber sleeve, even with softest formations.

If your problem is poor core recovery, call Christensen, and learn how you can get "good" cores at "Less Cost Per Foot."

*Diamonds Mean, "Less cost per foot."*

**CHRISTENSEN DIAMOND PRODUCTS**

1937 SOUTH SECOND WEST • SALT LAKE CITY, UTAH

**For more detailed information and case histories on the Rubber Sleeve Core Barrel, or any of Christensen's complete line of conventional and wireline core barrels, write or call Christensen Diamond Products Company.**

YOU'LL BUILD BETTER AND MORE ECONOMICAL MUD SYSTEMS WITH

SUPER-COL

(packaged in 50 lb. bags.)

MILWHITE SUPER-COL SAVES MATERIAL

MILWHITE SUPER-COL SAVES RIG TIME

MILWHITE SUPER-COL SAVES MONEY

MILWHITE SUPER-COL IS STABLE AND PERMANENT

MILWHITE SUPER-COL IS A SPACE SAVER

*Drilling Progress through Mud Research is continuous at Milwhite*

MILWHITE

MUD SALES COMPANY

HOUSTON, TEXAS

cased off, allowing air or gas to be used as the drilling agent.

Rox Drilling Co., also of Ft. Smith, contracted to drill the Carpenter with cable tools to a depth of 3,437 ft., putting it through the uppermost gas zone.

When Wolfe Drilling Co. skidded its rotary unit over the hole to go on down to total depth of 7,355 ft., gas from the Upper Carpenter was available for rig use.

**AM&S has been the sole operator in Aetna field since its discovery in 1955.**

The field was opened by Athletic's No. 1 James Mantooth, section 15-8n-27w, which was completed as the first triple producer in the state.

The field now contains 11 producing wells—all of them operated by Athletic. Of these, only one is a single-pay producer. Four are dual completions, and five are triples. All produce dry gas from various zones in the Atoka and/or Morrow groups of lower Pennsylvanian age.

At the moment, another venture (a dual prospect) is being completed, and three more are drilling.

At the time of its discovery, Aetna field was 8 mi. southeast of production in the Cecil (Atoka and Morrow) field. The discovery was drilled primarily on the basis of surface geology.

# Shells Prop Fractures

**Two problems for hydraulic fracturing—heavy overburdens and hard formations—are being solved by substituting walnut shells for conventional propping sand.**

During the ten years or so since the inception of hydraulic fracturing, carrier agents have been altered often and sometimes radically—ranging all the way from gelled oils to acids to straight water.

The principal propping agent has remained specially graded Ottawa sand, although changes have been made in grain size and concentration.

For some formations, these alterations in sand size and quantity have been sufficient to reach the desired fracturing results.

But for wells where high overburden pressures and hard formations exist, sand has been found seriously lacking in some important aspects.

**The shells, in contrast to sand, but in common with certain other organic materials, have been found to flatten out when subjected to high compressive pressures.**

Sand grains become either embedded or crushed when overburden loads become excessive.

Whether the sand crushes or embeds depends almost entirely upon the hardness of the formation it is supporting.

And it is with formations sufficiently hard to crush the sand that walnut shells have proved most effective.

Rounded and graded particles of walnut shells have been used in more than 35 wells in half-a-dozen states.

**Gulf Research & Development Co. has conducted experimental work with walnut shells for the past two years, with generally successful results.**

The first field application was made last year in a Noble County (Okla.) oil well. Shortly afterward, another job was successfully completed in a Johnson County (Ark.) gas well.

More recently, treatments have been made in the wells located in Colorado, New Mexico, West Texas, and Wyoming.

A typical example of the mechanics involved is this report on an Oklahoma well treatment:

A new producer in an established field was plugged back to 5,010 ft. and perforated with an eight-way jet at 4,976 ft. Perforations were ⅜ in. in diameter. The tubing was hung at 4,907 ft.

As treatment began, water in the hole was displaced with oil, and an additional 20 bbl. of crude were pumped down the annulus at formation breakdown pressure up to 3,250 psi.

After the break occurred, 2,300-psi. pump pressure was enough to complete the treatment.

The initial breakdown fluid was followed with 5,544 gal. of gelled lease oil with fluid loss additives, and 9,576 gal. of gelled crude carrying a total of 650 lb. of 8/12-mesh walnut shells.

Injection was at the rate of 12 bbl. per minute, with pump pressure ranging between 2,000 and 2,300 psi.

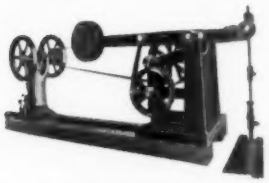
The well was completed flowing 312 b/d of oil.

**The walnut shells generally are furnished in three grades—8/12 mesh, 12/20 mesh, and 20/40 mesh.**

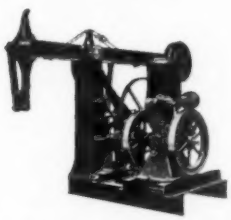
Field tests have indicated superior results with the larger two sizes.

The maximum fracture capacity obtained by Gulf with the 8/12 mesh shells have been 32,000 millidarcy-feet under overburden pressure of 3,000

## "Oilwell" Pumping Units down through the years



**1902** This early beam-type pumping unit had cast-iron frame and single-reduction, open-spur gear train.



**1916** Featured unitized structural steel walking beam and base beam. Note double-reduction, open-spur gearing.

**1928** This foreshadowed modern units with its counterbalanced cranks and enclosed single-helical gearing mounted in tapered roller bearings.

**1935** By this time, slab-type counterweights were introduced. Symmetrical gear cases permitted end-for-end reversal of shafts for utilizing both sides of gear teeth.

**1955** Fully adjustable counterbalanced cranks were employed with counterweights moved easily along calibrated crank rails.

# The NEW *Century* Series

## developed for oil's second century

## The Pumping Unit with ALL the wanted features

THE "OILWELL" ALBUM at left shows some of the gear-driven, all-metal pumping units which Oil Well Supply has pioneered since the beginning of the century.

"Oilwell's" new Century Series grows out of our long experience and our intimate acquaintance with the needs and desires of well operators . . . and have every feature wanted in a unit.

Century units give you long stroke lengths. Greater stability is achieved through the use of T-shaped structural steel bases, giving a wide spread to the front legs of the samson post. New and quiet reduction gears have external streamlining for better appearance.

Your "Oilwell" representative can give you further technical information about the design of these new units, which assures you of long service at lowest cost.

*USS and "Oilwell" are registered trademarks*

**Oil Well Supply Division of United States Steel**

USS

Executive Offices: Dallas, Texas
Export Office: 30 Rockefeller Plaza, New York 20, N. Y

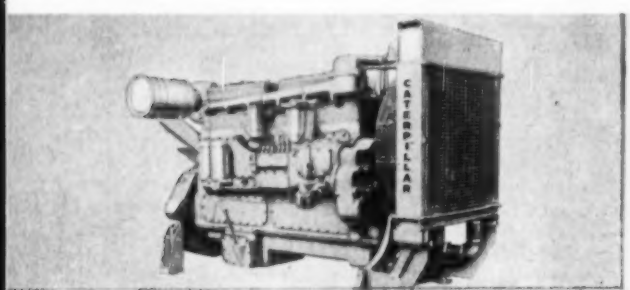
# engine power
BY CATERPILLAR

# New engine output and performance for oilmen

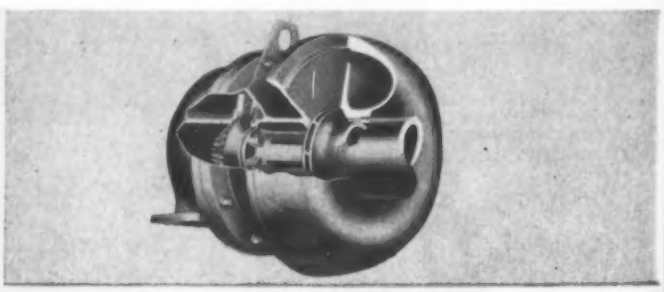
## The new Cat D342 can lower your over-all costs

Whether you need prime or auxiliary power for drilling, laying pipe, pumping or powering a crew boat, the new Caterpillar D342 Diesel Engine helps cut costs and step up production. It's available in three versions—industrial, marine and electric set, both turbocharged and naturally aspirated. Ask your nearby Cat Dealer to show what it can do for you or specify its top performance on your new equipment.

Engine Division, Caterpillar Tractor Co., Peoria, Illinois, U.S.A. Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



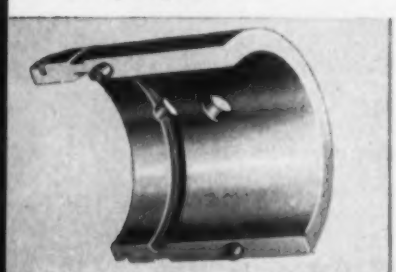

**The turbocharged D342 develops 320 HP (maximum output) and 260 HP (intermittent), both at 1,300 rpm. For continuous duty it will produce 220 HP at 1,200 rpm. It measures 90 inches long, 44 inches wide and 60 inches high.**



**Turbocharging uses energy from the engine exhaust gases to pack more air into the cylinders. Fuel consumption per horsepower-hour is actually lowered and efficiency raised when this otherwise wasted exhaust energy is put to work.**

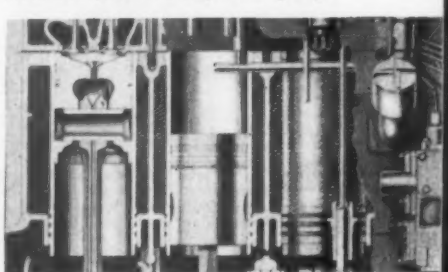
## These vital parts reduce down time, save you money

**Steel-backed aluminum alloy bearings have great strength and durability. Their rapid heat dissipation means cooler running for very long life.**



**Fuel assembly, designed and built by Caterpillar, features individual fuel injection pumps and large, single orifice valves to prevent fouling, even when engines idle for long periods.**

**Full-length, wet-type cylinder liners are induction hardened. Liners are chemically treated to retain oil on liner walls. Pistons ride with minimum wear, heat is dissipated rapidly.**



## Buying Cat Engines means more than mechanical excellence

**BURNS WIDE VARIETY OF FUEL** from JP-4 to crude with the same fuel system. Corrosion-resistant parts available if desired.

**CATERPILLAR DEALER ENGINE SPECIALIST** is your consultant. He's backed by a skilled staff of factory-trained servicemen. Call him.

**CAT PARTS AVAILABILITY** is the best in the industry, in line with superior dealer service. More than 400 domestic Cat parts stores.

psi. Shell concentration was 0.7 lb. per gal.

As the overburden pressure was increased to 7,000 psi., a maximum fracture capacity of 11,000 millidarcy-feet was obtained with a concentration of 0.6 lb. per gal.

Less concentration of rounded shells is required for maximum fracture capacity when 12/20-mesh particles are used.

For an overburden load range of 3,000 to 7,000 psi., the desired concentration is from 0.3 to 0.5 lb. per gal.

**All but four of the walnut-shell applications so far are said to have been successful mechanically.**

Ken Fisher, vice-president of Cherokee Laboratories, Inc., which has furnished the shells for the tests, says the four failures were due to screenouts, believed to have been the result of excessive shell concentration.

"Field results," says Fisher, "seem to indicate that the mechanics of successful fracturing operations are closely tied with control of shell applications. But since the density of the shells is only about half that of sand, the screenout tendency should be substantially less."

"The use of rounded shells," he adds, "presents no inherent mechanical difficulty, and no more than ordinary caution should be necessary in handling or placing them."

**Field testing has shown some other advantages of walnut shells, aside from their value in propping hard formations,** says Fisher.

"The service companies have reported reduced wear on their equipment and greater pumpability because of reduced friction when using shells," he says.

"Shells also are easier on wellhead and well pumping equipment, since they do not have the abrasive action of sand. Cleanups generally are faster and easier."

**The cost of walnut-shell application, however, is higher than when sand is used.**

Fisher says that the economic advantage of sand likely will restrict the use of shells to those wells where adequate fracture capacity can't be obtained otherwise.

A service company representative adds that, where the use of shells is indicated, they will do the job better than any other product.

A cost study just completed on ten West Texas wells shows that the cost of walnut-shell treatments averages $50 to $100 per treatment higher than sand.

With a Petroleum and Natural Gas Department in Calgary staffed with technical men, and with nearly 300 of our branches located in Western Canada and the Northwest and Yukon Territories, we are in continuous touch with Canada's oil and gas developments. For information on any phase of the Canadian petroleum industry, please send your letterhead request for our complete and up-to-date review of developments. It contains our latest map, statistical data on the principal Canadian oil and gas fields, and a summary of the special services we offer to the industry.

Address your inquiry either to

Petroleum and Natural Gas Department
The Canadian Bank of Commerce
309 Eighth Avenue West
Calgary, Alberta, Canada

*or to*

Mr. John P. Moreton
Resident Representative
The Canadian Bank of Commerce
151. Commerce Street, Dallas, Texas

*We do not advise regarding speculative securities.*

*In Canada, it's—*

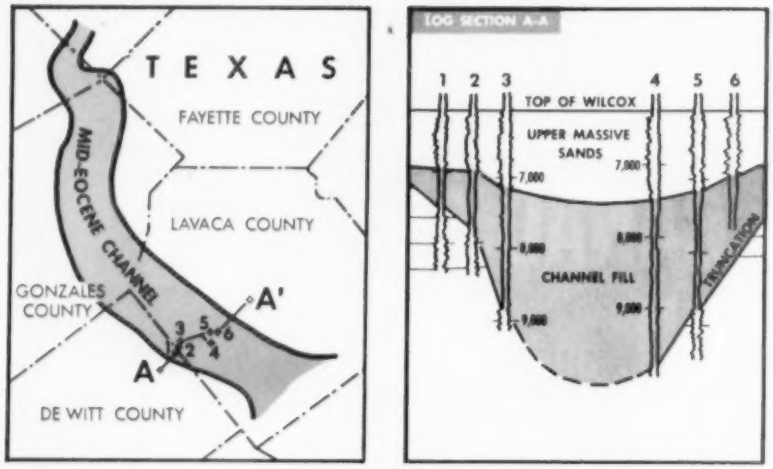
**THE CANADIAN BANK OF COMMERCE**

Head Office Toronto 1, Canada

*More than 800 branches across Canada*

Branches also in London, England; New York, San Francisco, Los Angeles, Seattle, Portland, Ore.; Bridgetown, Barbados; Kingston, Ocho Rios and Port Antonio, Jamaica; Port of Spain, St. James and San Fernando, Trinidad; Nassau, Bahamas.

*Resident Representatives in Chicago, Ill.; Dallas, Texas*
*European Representative, Zurich, Switzerland.*




**ELECTRICAL LOG study of more than 50 wells in Southwest Texas led geologists to . . .**

# Find Texas Mid-Eocene Channel

**A study of electrical log information has revealed a mid-Eocene channel 3,000 ft. deep, 50 mi. long, and 10 mi. wide in the vicinity of Yoakum, Southwest Texas.**

The first clue to the subsurface canyon came from Pure Oil Co. No. 1 Vick, the 1945 discovery well of the Yoakum gas field.

Pure encountered 1,585 ft. of almost continuous shale instead of the normal Wilcox and other zones expected in the area.

The channel, from its mouth in southwest Lavaca County, curves northwest, then north, to the eastern tip of Caldwell County, diminishing progressively in size, and apparently reaching the surface updip from an outcrop of Carrizo sandstone.

It evidently is filled with shale, with the upper massive sands of the Wilcox resting above it.

**The tracing of the channel was made at a regional meeting this week of the American Assn. of Petroleum Geologists in Houston.**

The meeting was sponsored by the Gulf Coast Assn. of Geological Societies and the Gulf Coast section of the Society of Economic Paleontologists & Mineralogists.

William V. Hoyt, consultant geologist at Yoakum, presented the paper on the channel, saying:

"The evidence points conclusively to an erosional origin, which is undoubtedly the same as in many other occurrences of a similar nature located on continental shelves . . ."

**Findings also were presented to show that the asphalt content of the Anacacho limestone of Southwest Texas is the residuum of lighter oil that originated elsewhere and was not emplaced simultaneously with the rock.**

The theory that the bitumen was deposited along with the limestone was presented several years ago.

But this week, Lee L. Harvill, of the University of Houston graduate school, disputed that belief in a paper presented as part of his thesis for a Master of Science degree.

To demonstrate his theory, Harvill immersed two 1-in. cubes of asphaltic limestone in dilute hydrochloric acid until effervescence ceased.

"The residue was a spongy, limestone-free mass of asphalt," he said. "If any limestone particles had been suspended in asphalt within these cubes, they would have remained unaffected by the acid."

Harvill then immersed similar blocks in gasoline until all the asphalt was removed except for surface stains. "After solution of the asphalt, the rock remained coherent, confirming the idea that the limestone and the asphalt are present in continuous phases," he said.

These and other tests and observations provide convincing evidence that the asphalt was formed in other source beds and migrated into the Anacacho limestone, Harvill added.

**A method was described for distinguishing between offshore bar and river deposit "shoestring" sands to help the oil hunter predict trends of possible producing formations.**

Offshore sand bars generally run parallel to prospective depositions, while river sand bars are sinuous and usually perpendicular to the general strike.

John J. W. Rogers and Cyrus Strong, of the Rice Institute Geology Dept., presented their idea of how to differentiate between the two types of "shoestring" sands using samples from even a single exploratory test.

Beach sands show "an extremely restricted range of mean sizes and sorting coefficients." River sands with sorting coefficients equal to those of beach sands are invariably coarser.

**The fact that the oil producing fold at Sunniland (Fla.) field is small and affects "only the bottom 5,000 ft. or more of more than 11,000 ft. of section" was brought out in a detailed discussion of the field.**

The 11-sq. mi. Sunniland field, Collier County, produces from the Sunniland formation just below 11,600 ft. It was discovered by Humble Oil & Refining Co. in November, 1943.

The talk on Sunniland was made by Harbans S. Puri and Joseph E. Banks, of the Florida Geological Survey.

They also pointed out the apparent existence of a middle Eocene age unconformity below the flat surface of the field and above the nearly flat beds of the subsurface.

And they said that poor symmetry and the presence of two high points indicate that the producing structure is depositional and reflects a buried sea topography.

**Interpretive work utilizing electric log and micropaleontology data has thrown a new light on the nature of the huge Thornwell field structure in southwest Louisiana.**

The field, located in Jefferson Davis and Cameron Parishes, produced 43.5-billion cu. ft. of gas and 1.2-million bbl. of condensate up to Jan. 1, 1959. At present, 11 wells are producing from six sands.

With early geological and geophysical data as a basis, it was first thought that the structure was an anticlinal closure against the down-thrown southeast side of a northeast trending fault.

But Frank R. Hardin, Houston geologist, offered newer information that indicates the structure is a large dome, with the syncline on the north flank lying several miles north of older wells in the field.

"It now appears that the main fault is located more nearly over the center of the structure than across the north flank," he said.

There are indications of an increased stratigraphic section and probable new sands on the south side of the Thornwell structure, he added, so that reservoir conditions may be better there than on the north.

# How Foster Wheeler gives you "profits" from chemicals you don't make

It's a matter of getting full value out of ideas . . . because ideas that start with one chemical product or process can often make another *different* product or process better, or more profitable.

Today, for instance, one producer of *methanol* is enjoying benefits of "profit ideas" based on FW's experience in combining methanol and ammonia synthesis. Another example, FW's design for production of high quality phthalic anhydride makes possible new profit-making efficiency for plants with capacities of three tons per day or more.

Find out about these and many other "profit ideas" FW can offer, by writing to Foster Wheeler Corporation, 666 Fifth Avenue, New York 19, N.Y. Ask for the new booklet about "The Plant You Want to Build".

*Heat Engineered* products, plants and processes . . . for the world's industrial progress.

**FOSTER WHEELER**

NEW YORK LONDON PARIS ST. CATHARINES, ONT.

—petroleum processing —chemical processing —specialized installations

**ESSO RESEARCH works wonders with oil**

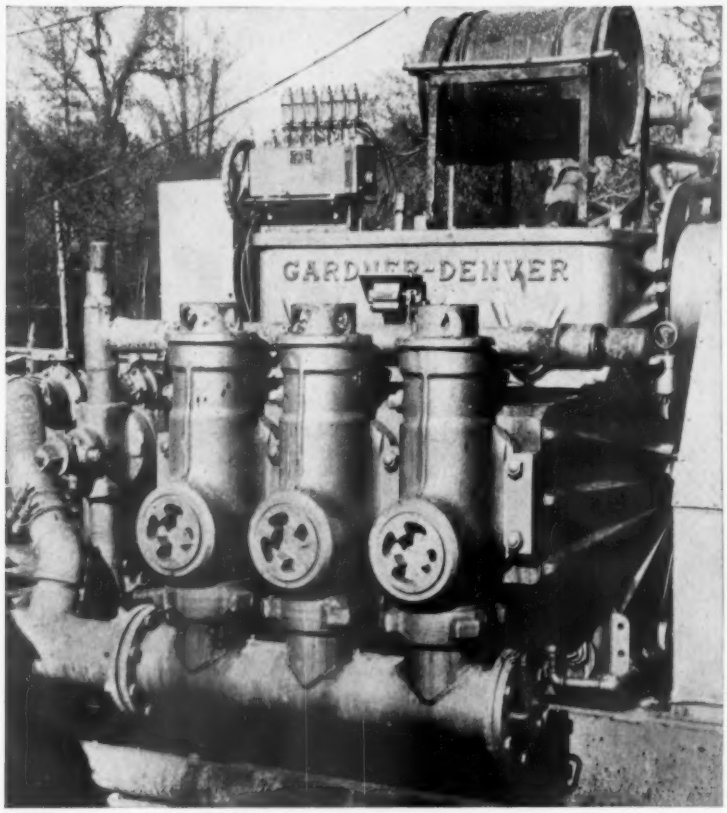
*Helping you jet there sooner!*

*You get your "welcome home" hug hours sooner—in today's jet age. And the jet age itself arrived here sooner, thanks in part to a special oil developed by Esso Research. Every jet engine throughout the free world grew up on it. And most pure jets flying today still use it and it alone. For happy homecomings or "happy motoring"* . . . **ESSO RESEARCH** *works wonders with oil.*

Esso

# When wells call for high-pressure servicing ... Gardner-Denver helps meet the need

- Cementing
- Work-over
- Plugging back
- Acidizing
- Water fracturing
- Sand fracturing
- Acid fracturing




**TESTING NEVER ENDS**

Superior product performance is never an accident. Skilled Gardner-Denver men continually test Gardner-Denver equipment against rigid specifications to insure uniformly high quality in product after product. At Gardner-Denver *there's no substitute for men*—our 100-year philosophy of growth.

Gardner-Denver plunger pumps have passed the toughest test of all: meeting day-to-day demands of high-pressure service in oil fields throughout the world.

Gardner-Denver well-servicing pumps are compact, have reserve strength for extreme operating conditions. Fluid end parts—valves, plungers, liners, cylinders—can be inspected, maintained and changed on the rig to meet various field conditions.

Four models to choose from: Gardner-Denver PA-8, a 310 hp pump, delivers a pressure range from 1550 to 10,000 psi. Model PN-7 provides pressure from 847 to 10,000 psi, volume from 43 to 482 gpm. Model PE-5, 130 hp, provides a 1430 to 6000 psi pressure range. Model PG-3, 58 hp, delivers pressure from 1650 to 3050 psi. Write for Bulletin WS-1.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

## GARDNER - DENVER

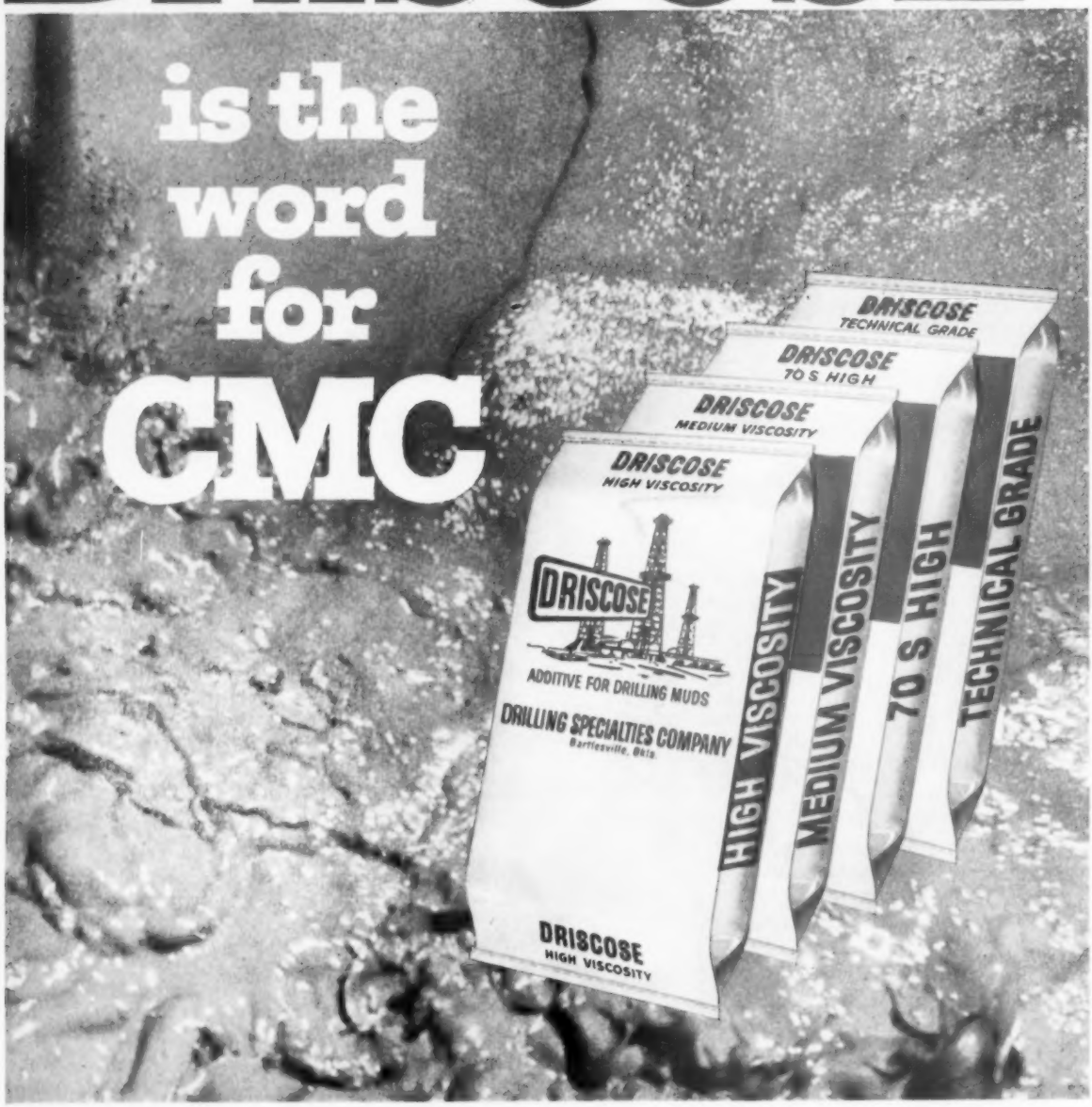
Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

Gardner-Denver Export Division, 233 Broadway, New York 7, N. Y.

Oil Field Offices: Casper, Cleveland, Columbus, Corpus Christi, Dallas, Denver, Durango, Edmonton, Ellinwood, Evansville, Houston, Huntington, Jackson, Kansas City, Lafayette, Los Angeles, Mexico City, New Orleans, Odessa, Oklahoma City, Pittsburgh, San Francisco, Shreveport, St. Louis, Tulsa, Wichita, Winnipeg

# DRISCOSE*




Since 1946, DRISCOSE has been recognized as the ultimate in Sodium Carboxymethylcellulose (CMC) for use with drilling muds. Our drilling engineers and research chemists continue to pioneer new techniques and new types of CMC for more efficient and economical drilling operations.

As a result of the most extensive research, field testing and use in the industry, DRISCOSE is provided in a wide range of viscosities and purities for every drilling condition.

See your mud dealer . . . or write for full details.

*DRISCOSE is a trademark for Sodium Carboxymethylcellulose

**DRILLING SPECIALTIES COMPANY**
Bartlesville, Oklahoma

# Deep-Hole Pumping Tool Is Tested

**Successful pumping of wells at depths of 15,000 ft. or more is one of the advantages claimed for a rod-load reducing tool under development in California.**

The device is designed to trim the load on any well, thus making it possible to pump, with rods, deep wells that previously could not be produced in this manner.

Among other advantages claimed for the tool:

- It will make possible the pumping of any well, regardless of depth, with one standard-size pump unit. Its inventors, R. O. Chancellor, veteran oil man, and his son, Forrest, say the tool will enable the pumping of wells up to 15,000 ft. in depth with no more than a 10-hp. unit.
- It will make possible the use of one uniform size of rods.
- It will cut operating costs to the extent that presently marginal or even noncommercial operations can be put into a commercial category.
- It will enable the use of larger pumps with existing power installations, thus increasing production, in some cases, at very little cost.

**An average 81% reduction in loads was measured when the tool was field-tested a few weeks ago in Kern Front (Calif.) field.**

It was installed in Carrec Oil Co. No. 8, section 11-28s-27e, Kern County, an 1,886-ft. well that grosses 200 b/d of fluids, netting about 8 b/d of 12-gravity oil.

Production stayed the same during the test, but greater efficiency in production operations was noted.

The tool was positioned in the tubing string at 1,011 ft. A conventional oil well pump with a 2¾-in. plunger also was located at this depth. It was actuated through a string of 1 11/16-in. rods reciprocated by the pumping unit, which had a 10-hp. electric motor as a prime mover.

A 2¼-in. plunger pump was located at 1,674 ft. It was actuated by the new tool, through 1 11/16-in. rods.

Because of the design of the tool, the downstroke action of the upper rod string from surface to 1,011 ft. caused upstroke of the rod string from 1,011 ft. to 1,674 ft. Heavy rods were used to simulate the normal rod load of a 4,500-ft. well.

Results of Dynamometer tests made on the installation indicated reductions of rod and pumping unit loads as follows:

Maximum load, from 9,664 lb. without the device to 5,360 lb. with it; average upstroke, from 9,263 lb. to 4,780 lb.; peak torque, from 132,270 in.-lb. to 76,104 in.-lb.; polished rod hp., from 5.50 to 3.12; and overloads, from 12% (gears) to none.

DOWNHOLE TOOL (on truck) reduces rod load to facilitate pumping of deep wells.

The pilot tool tested at Kern Front is 24 ft. long, with a 5½-in. OD. It costs about $1,500 to build.

It consists mainly of a series of shells forming two separate cylinders, each containing hydraulic fluid, and an opening through the center for the passage of produced fluids through a series of valves.

**The tool uses forces available in the well, including hydrostatic head, pressure, and the weight of the rods —converting them into energy to lift a portion of the fluid from the hole.**

Here's how it might be used to pump a well 11,000 ft. deep.

The bottom string of tubing would be run to the depth at which the tool would be set; in this case, 5,000 ft.

Next stop would be to run rods and pump plunger in the 5,000-ft. string of tubing.

The rods would be spaced just as in any well.

Then the hole could be filled with fluid to get quicker action in starting to pump the well.

Next, rods would be attached to a polished rod attached to the bottom of the tool. The tool would be attached to the string of tubing, and an upper pump barrel would be attached to the top of the tool.

Then the remaining 6,000 ft. of tubing would be run. The top plunger and a string of rods would be run inside the 6,000-ft. string of tubing until it bore against an adapter on the top piston stem of the tool.

Rods on top would be spaced on the upstroke (rods below would have been spaced on the downstroke). Then, again for quicker action, the upper string would be filled with fluid.

A standing valve in the top of the tool would prevent the fluid from going past 6,000 ft.

When the amount of fluid reaches the point where the stem starts to move down, the stem forces hydraulic fluid into the contained chamber.

This puts pressure under the lower piston, to which the rod string is attached, causing the bottom piston to move up, thus pumping one stroke with no power other than the hydrostatic head and the weight of the rods. At this point, all of the weight above the tool (fluid and rods) exactly counter-balances the weight below the tool.

The operator continues to fill the hole, attaches a pump unit to the upper polished rod, and starts to pump the well.

**The only power exerted is the weight over and above the counter-balance point, which would simply be the weight of 1,000 ft. of fluid and rods in an 11,000-ft. well.**

On the upstroke, the excess weight is removed from the tool causing the lower string of rods and the weight on the lower piston to give a reverse hydraulic action on the upper piston that pushes the top pump plunger and fluid upward. The two rod strings are not attached, and the action is smooth, with no jerks on the rods.

# saved: $500 per day in Oklahoma's deepest well

At a depth of 24,002 ft., Shell Oil Company's Rumberger #5 in Elk City Field, Oklahoma, is the deepest well in Oklahoma and the second deepest well in the world. During drilling it was decided to change to an oil base drilling fluid when high temperature gelation of the lime-base emulsion mud was causing too much trouble.

The interval between 20,120 ft. and 24,002 ft. was drilled with *Black Magic Supermix*. In addition to greatly reducing mud problems due to high temperature (as high as 360°F), improving hole stability and retaining the accuracy of log interpretations – the use of Black Magic considerably reduced mud costs. The following is from a report published in Oil & Gas Journal, September 7, 1959*:

**BLACK MAGIC** *oil base drilling fluid*

***"Total net cost for the oil base mud system on this job amounted to $40,000 or about $285 per day, or $10.30 per foot drilled. Compare this mud cost with the maintenance for the 13.5 lb. per gal. lime-base mud used over the 140-day period prior to changing to oil base mud. It amounted to approx. $110,000, or about $785 per day or $19.50 per foot drilled. Thus this specific oil-base-mud system saved $70,000 or $500 per day, assuming maintenance costs for the lime-base mud would have remained the same had it remained in use."***

Of the seven deepest wells in the world (drilled beyond 20,000 ft.), Black Magic was used to drill three of them. *The mud cost in each of the Black Magic wells was considerably less than any of the other four drilled with water-base mud.*

* *"Oil Base Mud Passed Test in Deep, Hot Hole," by Jack MacEachern and Al Seaman. Copies will gladly be mailed on request.*

## OIL BASE, INC.

130 ORIS STREET, COMPTON, CALIFORNIA
Plants in Bakersfield, Duncan, Compton, Houston, Lafayette, Odessa

Offices: Bakersfield, Long Beach, Ventura, Houston, Odessa, Oklahoma City, Duncan, Lafayette, Houma, Calgary. *Export Sales:* Oil Base de Venezuela, C.A. *Export Offices:* Anaco, Lima, Bogota, Mexico D.F., Hamburg

OB PRODUCTS

# What's New / IN EXPLORATION, DRILLING, PRODUCTION

**The proposed nuclear blast project in the Athabasca tar sands is very much alive, despite recent reports about its being dropped, according to Canada's scientific attache in Washington, D.C.**

Henry Williamson last week said that feasibility studies of the project are still going on.

Williamson said the statement by Paul Contois, Canadian Minister of Mines, that the proposal by Richfield Oil Corp. (L.A.) had been cancelled, was not the official Canadian view.

The attache did say, however, that the tentative explosion date set for next spring probably can't be met.

•

**A wild well in Hillsdale County, Mich., was brought under control last week after spraying 3,000 bbl. of fluid per hour for nearly a week.**

The well, located in section 23-5s-3w, in the productive Scipio area, was bottomed at 3,973 ft. in the Trenton-Black River formation.

The well blew out after the crew had set 5-in. casing with 250 sacks of cement. The escaping fluid was oil with 50% to 60% water.

Boots Hanson and a crew from Houston, Tex., brought the well under control.

•

**Two oil-producing leases are included in the approximately 200,000 acres Texas will offer for lease Dec. 1.**

Sealed bids will be taken on public school, prison, and hospital board lands.

The two producing leases consist of 777 acres in Turtle Bay, Chambers County, and 147 acres in Dickinson Bayou, Galveston County. Both are presently under 25-year leases that expire Jan. 1.

Bidders on these two tracts will be required to give the state one-fourth of all future production, plus a competitive cash bonus. Other requirements are a minimum bonus of $15 per acre and $5 per acre annual rental.

There are 48 riverbed tracts, ranging from 25 to 370 acres. A 1/6th royalty plus $15 per acre minimum bonus and $5 per acre annual rental are required. All of these leases are in the vicinity of oil or gas production.

Leases in submerged areas total 162,988 acres in bays and 16,110 acres in Gulf of Mexico tidelands (inside the 3-mi. limit). Leasing requirements are same as for riverbed leases.

The remaining acreage to be offered consists of 4,200 acres of prison land in Brazoria County; about 3,000 acres in the Alabama and Coushatta Indian reservations, Polk County; 807 acres of hospital lands in Rusk County; and a 45-acre sulfur lease in Brazoria County.

•

**The Montana Oil & Gas Conservation Commission next week will hear a proposal to raise the state's spacing rule for oil wells.**

The proposed amendment would allow one well per 40 acres on a statewide basis as compared to the one well per approximately 18 acres (if the operator holds 160 acres) in effect at present.

•

**The Arkansas Oil & Gas Commission met late this week to consider adding 5 mills onto the present 2½-mills-per-bbl. oil production assessment.**

The assessment is made against each barrel of oil produced, saved, and sold from all Arkansas sources discovered after Jan. 1, 1937.

George Holden, director of conservation and production, says assessment income to the commission has declined to "considerable less than the absolute minimum required to perform" its functions required by law.

Part of the revenue decline was attributed to the strike-bound American Oil Co. refinery at El Dorado, which normally handles 44% of Arkansas daily production.

•

**The government is satisfied with progress in halting subsidence under Long Beach (Calif.) Naval Shipyard installations.**

William P. Gray, assistant to the U.S. Attorney General, says the government hasn't tried to reactivate its request for an injunction to shut down Wilmington field. (PW—Nov.6'59,p25).

A Long Beach harbor official says the subsidence could be halted in six months.

•

**The Texas Supreme Court will hear ownership arguments over mineral rights beneath U.S. Highway 80, Wood County, on Jan. 13.**

The high court has agreed to review lower court decisions affirming ownership of 25% interest in mineral rights on a 7-acre strip by Bertha Ida Williams and others. The trial court said the state holds just 75% interest in the mineral rights under grants of right-of-way made in 1918 and 1933.

The State Highway Dept. contends all minerals were acquired by the state.

Although drilling is not permitted on highways, the owner of mineral interest under a way could unitize with adjoining operators or drill a directional hole.

•

**The Montana Land Board's sale of oil and gas leases brought $53,479 for 37,855 acres in 11 counties.**

Texaco Inc. was high bidder at the recent sale, paying $12.75 per acre for 633.76 acres in section 16-16s-17e, Stillwater County.

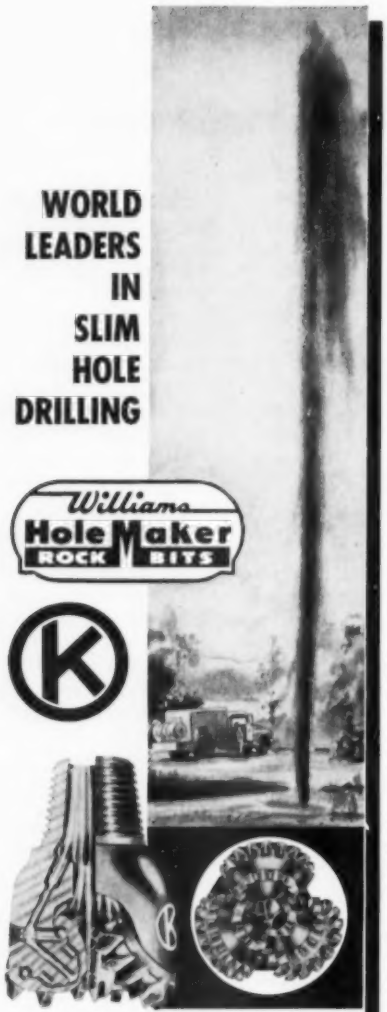
Ohio Oil bid $5 per acre for a tract in section 36-11n-38e, Rosebud County. Carter Oil bid $4.75 per acre for 368 acres in section 1-36n-4w, Toole County.

## Use at Wilmington

**This Wintroath Submersible pump is being lowered into a salt-water source well used in the fight against subsidence in California's Wilmington field. The pumps are equipped with General Electric 75-hp motors. Stainless steel and plastic are used in both pump and motor to resist corrosion.**

WORLD LEADERS IN SLIM HOLE DRILLING

Williams Hole Maker ROCK BITS



Accepted leaders in rock bits for either air or water. Highest Nickel Moly steel in a wide variety of tooth designs for soft to very hard formations.

Tungsten-tipped teeth, finest roller and ball bearings in precision machined races to eliminate thrust loads. Superior heat treating and rigid inspection to insure fastest penetration, exceptional life, maximum economy in any drilling.

PROMPT DELIVERY

Over 15,000 bits in stock (full or jet-hole water or air courses as requested). Every bit is fully guaranteed. Why accept less? Illustrated catalog sent on request.

COMPLETE RANGE OF SIZES FROM $2\frac{13}{16}$" TO $7\frac{7}{8}$"

MANUFACTURED BY OIL TOOL MANUFACTURING CO., INC. P. O. BOX 24 TONKAWA, OKLAHOMA TELEPHONE: 143

## Engineering

**A new design in fire-fighting equipment, which reportedy will enable reductions in insurance premiums on drilling rigs by 5% to 12% and possibly more, has been developed by Fire Control Engineering Co.**

The company says the premiums will be reduced if the contractor installs the unit on his rig and keeps it there throughout the drilling operation.

Available either on skid-mounts or truck-mounts, the units use the same chemicals—bicarbonate of soda with silica—as other fire-fighting equipment.

The big difference, says the company, is that the common problem of the chemical settling and sticking on the bottom of the tanks is solved by their equipment, which hydraulically inverts the tanks and automatically aereates, agitates, and fluidizes the chemical.

Inverting the tanks, says Fire Control, loosens any chemical that may have settled and makes it ready for action.

•

## Drilling Highlights

**West Texas**—Rowan Drilling Co. and McElroy Ranch Co. No. 1 Berthram R. Price, section 39, block 30, J. H. Gibson survey, Borden County, flowed oil at the rate of 35 bbl. per hour on drillstem test of the Strawn at 8,232-46 ft. The prospect is more than a mile northwest of Rafter Cross field.

In Scurry County, G. Scott Hammonds No. 1 J. Holladay, section 75, block 20, Lavaca Navigation Co. survey, recovered oil on three drillstem tests of a 140-ft. reef section in the Pennsylvanian. Recovery was 880 ft. of 43-gravity oil on 30-minute test at 7,308-58 ft. through ¾-in. choke.

The wildcat topped the reef at 7,218 ft., and showed its first oil on test at 7,228-58 ft. where flow was at the rate of 30 bbl. per hour. On a second test at 7,258-308 ft., the prospect flowed 47 bbl. in one hour. The test is 3½ mi. south of Diamond M field and 1 mi. northwest of the abandoned Allen Holladay pool.

**New Mexico**—Ohio Oil Co. No. 1 Ralph Nix, section 29-18s-26e, Eddy County, flowed 11,104,000 cf/d of through perforations at 9,070-115 ft. in the Bend. The discovery is 3 mi. southwest of Atoka field.

**North Dakota**—Amerada Petroleum Corp. No. 1 Signalness Unit, section 10-148n-96w, Dunn County, was completed for 313 b/d of oil and 186,000 cf/d of gas through perforations in the Devonian at 11,533-67 ft. The well is 3 mi. south of Bear Den field, previous southernmost producer on the Nesson Anticline. The discovery also is the first producer in Dunn County.

**Kansas**—Texas Crude Oil Co. and John O. Farmer No. 1 Rohrs, section 18-11s-33w, Logan County, yielded 30 bbl. of oil per hour through perforations at 4,325-29 ft. in the Lansing-Kansas City. The prospect is 12 mi. southwest of Mingo field.

In Cheyenne County, R. G. Lawton No. 1 Leibbrant, section 36-3s-42w, recovered 655 ft. of oil on 1-hour drill-stem test of the Lansing-Kansas City at 4,495-531 ft. Recovery also included 80 ft. of slightly mud-cut oil and 20 ft. of mud. The wildcat is 2¾ mi. south of Rueb field.

**Wyoming**—Champlin Oil & Refining Co. No. 1 State, section 36-51n-68w, Crook County, was completed for 500 b/d of 19.6-gravity oil on the pump through perforations at 6,373-400 ft. in the Minnelusa. The discovery is 7 mi. northeast of Minnelusa production at Donkey Creek field.

**East Texas**—Delta Drilling Co. and Claud B. Hamill, No. 1 Willingham & Daniels M. M. Long survey, Smith County, flowed 278 b/d of 31-gravity oil through ¼-in. choke and open-hole section at 7,470-80 ft. in the Paluxy. The discovery is 1 mi. southwest of South Tyler field, an old area which produces from the Rodessa and James.

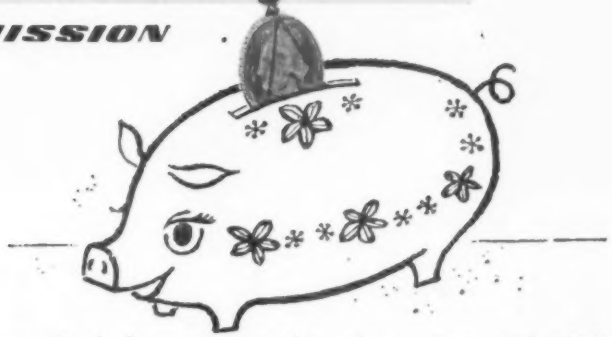
**Southwest Texas**—Barney Fisher and Lloyd Davidson No. 1 Nora Schulze, section 20, G. H. Paul subdivision, recovered 2,800 ft. of oil on 30-minute drillstem test at 7,654-64 ft. The prospect is 4 mi. northeast of production.

**Nebraska**—HLM Drilling Co., Dow & McHugh, and Stuarco Oil Co. No. 1 Frei, section 32-16n-52w, Cheyenne County, yielded 840 b/d of oil on the swab through perforations at 5,442-46 ft. in the J sand. The discovery is 1 mi. southwest of the shut-in Woten field.

**Mississippi**—American Petrofina Co. No. 1 Board of Supervisors, section 16-3n-7e, Smith County, flowed 7 bbl. per hour of 40-gravity oil through 8/64-in. choke and perforations in the Hosston. The opener is in Boykin Church field, which produces from the Rodessa.

# THE ALOUETTE SAVES REGULARLY...

## ON EVERY MISSION .



*In transporting, hauling, spraying, aerial inspection, construction work, stringing wire, or at nearly any job, the turbine-powered ALOUETTE II — operating in heat or cold, at high or low altitudes — SAVES DOLLARS.*

*PROOF: Check these facts:*

- ✻ *An Alouette sprayed an acre of brush along a remote powerline right of way in only 20 seconds for $7.26*
- ✻ *An Alouette transported four surveyors 20 miles to a 9,000 foot mountain landing at a total cost per man of $12.50*
- ✻ *An Alouette lifted and carried a 900 lb. seismographic drill rig 2 miles for $5.00*
- ✻ *An Alouette strung 8,000 feet of ⅜ inch steel cable in 1 hour and 40 minutes for $210.00*
- ✻ *An Alouette erected 30 telephone poles in 1 hour and 10 minutes at a total cost of $175.00*

*Regardless of the task or climate . . . the low-maintenance Alouette brings ECONOMY to helicopter operations. Contact Republic's Helicopter Division for complete details on any of the above missions and on how the Alouette can help fill your needs.*

*Designed by Sud Aviation

*The Alouette is assembled, tested and distributed by:*

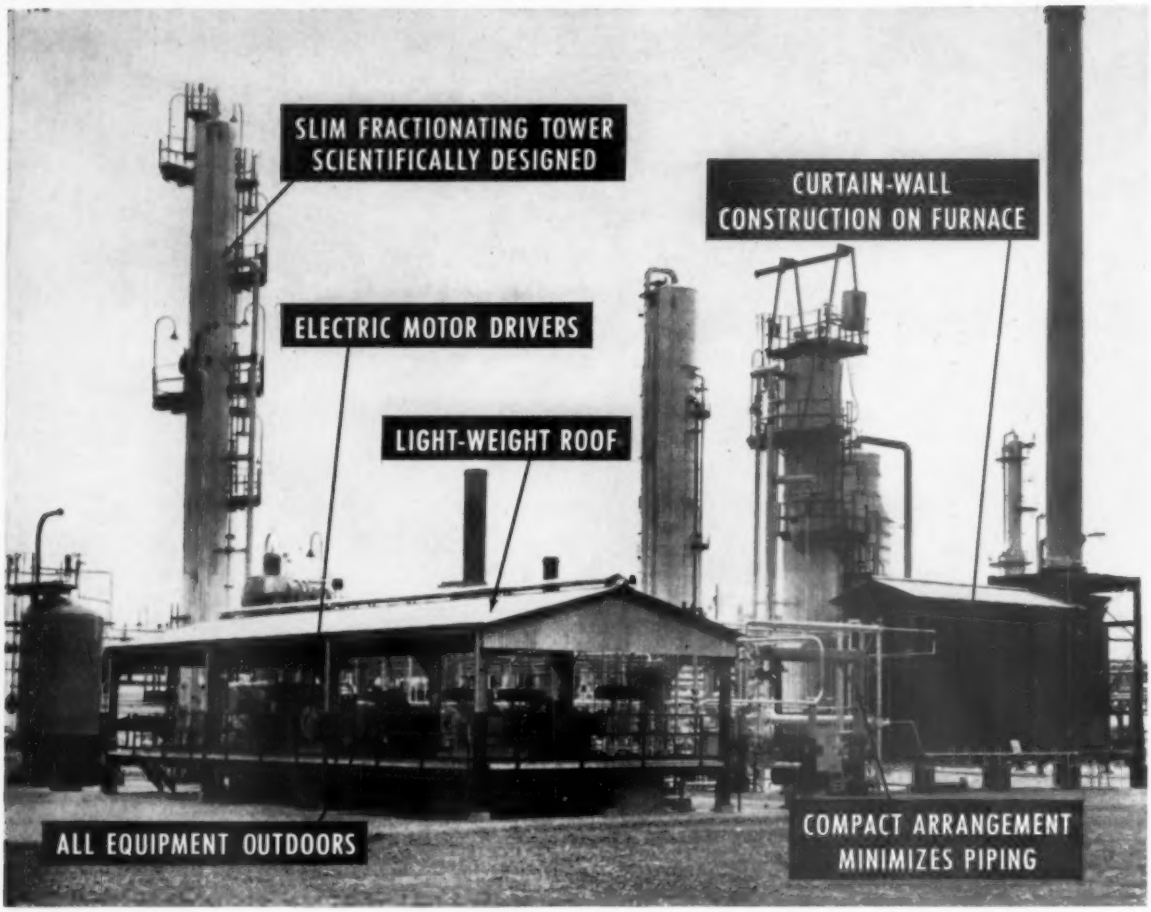
**REPUBLIC AVIATION CORPORATION**

**HELICOPTER DIVISION**

*Farmingdale, Long Island, N. Y.*

SPECIAL REPORT

COST REDUCTION IN
# $ REFINING




**SIMPLIFIED DESIGN** by Canadian Kellogg Co., Ltd., is exemplified in this modern hydrodesulfurization installation.

# Cost Cutting Is the Key to Tomorrow's

## *And Here's What Refiners Are Doing About It*

**The constantly rising cost of new equipment, and the increasing difficulty in obtaining capital for investment in new ventures, are the major reasons why refiners are looking ever more closely to means of reducing costs of construction and of operation of oil refineries,** according to a PETROLEUM WEEK survey of oil refiners and manufacturers of refinery equipment.

It wasn't so long ago that the chief concern of oil men was the discovery and the production of crude.

There was an old saying in the industry, "All profits accrue to the wellhead."

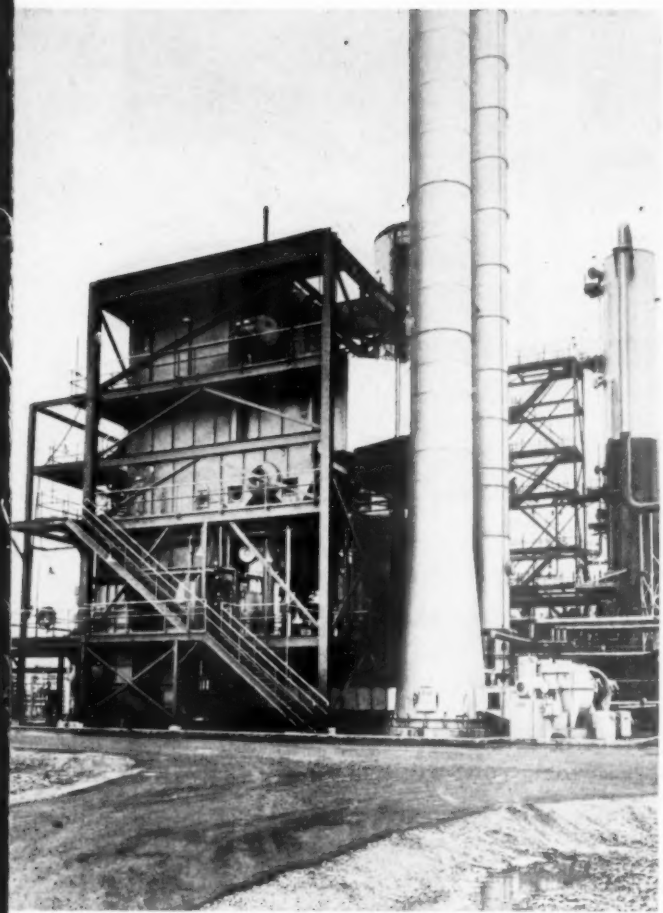
It was no deterrent that oil was frequently discovered in the world's most unlikely places, or that its production gave birth to some awkward political and social situations.

Once oil had been found, it was tacitly understood that the industry possessed plenty of talent to get it to a refinery, to process it, and to sell the finished products at a profit, wherever a market for them could be found or developed.

Today, oil men are taking an entirely different attitude. The fact that a barrel of gasoline in two nearby refineries, processing an identical crude, can be produced at a substantial difference in cost causes them to question the efficiency of their methods, and to scrutinize carefully every phase of the refining process.

**The importance of cost reduction is so great today that many refiners feel the time has come to re-evaluate completely the philosophy which, heretofore, has governed the design of their refineries.**

As oil technology has improved, as new processes replaced older methods or were added to them, the basic principles underlying the design of refineries have changed but little. Today, however, most refiners feel that these principles have lost much of their validity.



RUGGED BOILER construction follows simplified philosophy.

## Data from 108 Refineries

**To obtain a birds' eye view of how—and how much—refiners are cutting costs, Petroleum Week sent out a questionnaire to 130 oil companies operating 316 refineries in the U.S. and abroad. Answers received represented 108 refineries,** including 57 operated by major companies.

The results of the survey were then checked by detailed interviews with top refinery executives, and with equipment manufacturers and construction engineers.

With only one or two exceptions, all refiners that answered said they are actively engaged in changes intended to reduce costs.

But they differed greatly in their selection of areas where changes were the most effective in accomplishing that purpose.

Here is how they lined up:

| Areas of Cost-Cutting | Percentage of refiners who selected these areas as | | |
|---|---|---|---|
| | 1st choice | 2nd choice | 3rd choice |
| Improvements in processes, or in chemicals used in processes | 49 | 10 | 9 |
| Improvements in equipment | 10 | 30 | 7 |
| Use of electronic computers | 3 | 1 | 13 |
| Better corrosion control | 2 | 4 | 17 |
| Better utilities and prime movers | 4 | 2 | 5 |
| Improved maintenance | 4 | 13 | 8 |

# Refinery Profits

Some refiners have created within their own organizations departments for the sole purpose of studying simplification of design, elimination of duplicate equipment, reduction of structures, trimming of spares.

**Today refineries can be designed scientifically. As a result, smaller equipment will often yield capacities equal to, or greater than, yesterday's larger designs.**

Much of the equipment originally used in oil refineries had to be designed empirically; no scientific basis was available for exact calculations. In those days, therefore, it was wise planning to decide on a comfortable margin of safety for equipment sizes.

How close to the exact size required could a fractionating tower be designed, for example—or, a little later, a catalytic cracking reactor? How fast would a certain thickness of carbon-steel wear off under the effect of water, gases and liquids and under conditions never heard of previously? Nobody could tell.

Today, years of accumulated experimental data and the help of fast and accurate electronic computers, make it possible to design equipment that is basically correct, generally smaller and at a lower cost.

In their answer to the survey, many refiners indicated to Petroleum Week that, with the addition of some auxiliary equipment costing a mere fraction of what a new unit would cost, the capacity of many processes can be doubled.

**Refiners find that safety measures need be much less stringent today—and therefore less costly.**

At the outset, the industry was dealing with new products—inflammable, explosive, and considered highly hazardous. Understandably, the most exacting safety precautions were adopted. When in doubt as to the safe classification of a product, a piece of equipment, or a complete unit, refiners assigned it to the most hazardous category. Such precautions were obviously expensive.

Increased knowledge has gradually permitted a relaxation of some of these measures, at a great saving, and without in any way relaxing the strictest rules of safety.

Refiners, with the cooperation of such engineering organizations as the American Petroleum Institute, the

**continued ▸**

American Society of Mechanical Engineers, and others, have recently been able to revise safety codes, and to eliminate costly restrictions that are no longer justified.

For example, the API Recommended Practice 500, classifying areas for electrical installations in refineries, is being constantly revised in an effort to remove from the Division I classification (processes that are hazardous under normal conditions) processes that have conclusively demonstrated their freedom from hazard. Electrical motors designed for Division II areas need not be completely explosion-proof, therefore are much less costly.

**Duplication of equipment to provide continuity of operation in case of localized mechanical failures has become, generally speaking, outmoded.**

There are two reasons:

(1) Machinery has become, by and large, more reliable.

(2) A temporary loss of product, in case of failure, is considered by many refiners less costly than the initial investment for duplicate equipment.

This new trend eliminates the necessity for an enormous duplication of piping and valving, with one exception: Steam lines intended to fill with steam equipment that would be damaged by intense heat if the flow of product were stopped.

**Similarly, there is far less need today to install costly equipment to guard against power failures. Public utilities have proven themselves completely reliable, lessening the need for standby drives.**

Until quite recently, it would have been considered most precarious to depend on purchased electric power to drive a piece of machinery essential to a process, without a standby installation to drive it in case of accidental power failure. Such precautions, most refiners feel, are hardly needed today, and the saving in refinery construction cost resulting from that new attitude is considerable.

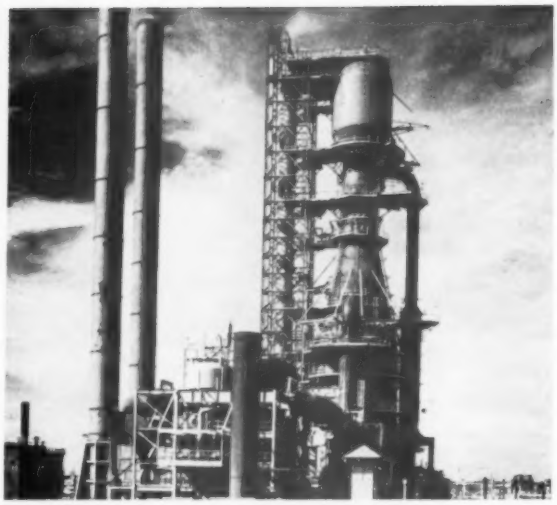
**Even the aesthetic conception of what an industrial plant's appearance should be has materially changed recently, for economy's sake.**

No longer is the power plant, for instance, the showplace of a refinery, with its impressive building, control room, and office. Today, boilers are left outdoors, barely covered with a tin roof. And the control room is consolidated with that of some utility, such as water treatment, in some central control house. At an enormous saving in structural steel, concrete, and brickwork, most process units are left exposed to the elements, their reactors, towers, and exchangers gaily painted in pastel colors.

**A serious influence upon the new philosophy has been the change in the relative value of money spent for capital investment on the one hand, and money devoted to day-to-day operating expenses on the other.**

Under present inflationary conditions, the matter of depreciation of equipment becomes particularly important when estimating the value of an investment. The future replacement cost of any piece of machinery will be much higher than its original cost today. But this factor cannot be taken into consideration taxwise. Consequently, refiners are sometimes tempted to select a less costly design. even though higher maintenance expenses may be required subsequently to keep it operating.

Yet more expensive equipment frequently results in operating costs so much lower—because the machine is faster, has greater capacity, will stand higher pressures—that any cheaper selection would be flagrantly wasteful.



TRANSFER LINE REACTOR, by Foster Wheeler Corp., improves cat cracker efficiency through separate feed inlets.

## Better Processes Rank First

**Improvement in processes appears to be the primary road to lower costs.**

In their answers to the PETROLEUM WEEK survey, over half of the refiners named this as the change that had contributed most to cost reduction (table, page 53).

In 48% of the changes, a substantial investment was necessary, while in about 30% the expense involved was said to have been relatively modest. The remaining 18% of the process improvements were accomplished through minor adjustments.

Over one-half of the improvements involved more automatic control of the units. But in only 20% has the manpower been reduced. In almost all of these cases, the employees were transferred to other duties, according to the returns.

Only 12% of the changes in processes were attributed to a computer study. As 45% of the companies said they were using computers for optimation studies, it would appear that only a small minority of refiners have already applied to their processes the results of computer studies currently under way. This indicates that many more changes can be expected, as computer studies now in progress are completed.

**A more generalized use of hydrogen is one of the most popular cost-cutting trends.**

Hydrodesulfurization is still the most frequent application of hydrogen, and the substitution of hydrogen treatment for conventional sweetening follows closely.

Over 20% of the refiners surveyed say they have substantially increased their hydrogen utilization. The hydrogen generally comes from the cat reforming operations, although some hydrogen is purchased. Concurrently, several refiners say that they are selling some of their hydrogen (PW—Sep.4'59,p36).

**Improvements in catalytic cracking are another effective means of reducing operating costs.**

**continued ▸**

# NEW!

MULTI-FUNCTIONAL VISCOSITY INDEX IMPROVERS

# PARATONE

# 400

# SERIES

ENJAY

# PARATONE 400 SERIES

## MULTI-FUNCTIONAL VISCOSITY INDEX IMPROVERS BOOST MOTOR OIL PERFORMANCE 4 WAYS!

- Improves Viscosity Index
- Essentially Eliminates Sludge Deposits
- Reduces Piston Varnish
- Reduces Pour Point

The new Paratone 400 Series, latest addition to Enjay's growing list of Prescription-Balanced Paramins, is an entirely new class of multi-functional Viscosity Index Improvers.

### COMBINES FUNCTIONS OF OTHER ADDITIVES

Provides the benefits of a viscosity index improver and a pour depressant as well as providing sludge dispersancy and detergency.

### FIGHTS ENGINE DEPOSITS

Motor oils prescription-balanced with Enjay's Paratone 400 Series essentially eliminate sludge deposits even under the severest stop and go driving conditions. In addition, you can market an oil assuring customers of:

- Cleaner Piston Skirts
- Clean Oil Screen
- Free Flowing Oil Supply

### COMPLEMENTS OTHER ADDITIVES

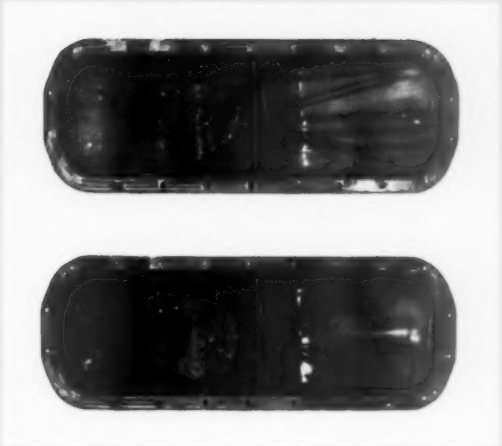
The new Paratone 400 Series may be prescription-balanced with Enjay's or other detergent inhibitors to provide an outstanding motor oil.

### THOROUGHLY TESTED

Before putting Paratone 400 Series of multi-functional viscosity index improvers on the market, Enjay subjected it to the most severe laboratory and field performance tests.

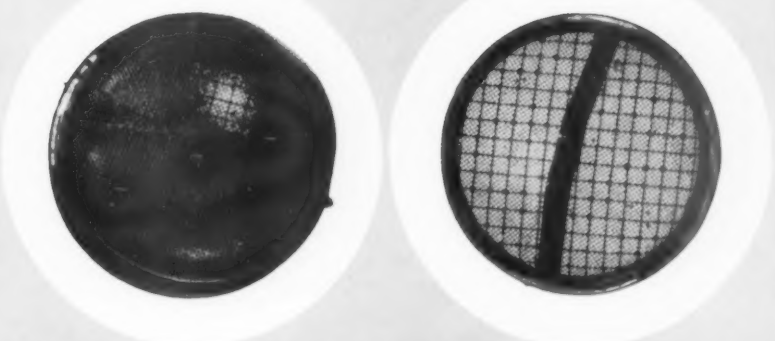
**Toughest test of motor oil additive performance** is the stop-and-go of *taxicab operation*. Enjay tests additives to their utmost in a fleet of 60 New York City cabs, under every driving condition the city can offer. Each test begins with a completely new engine, continues for over 25,000 miles with oil changes only every 4,000 miles. Engines are then pulled out, dismantled, and are carefully inspected.

Paratone 400 Series additives conclusively proved their worth in these tests. For details — see below and right.



**Oil pan at the top** shows effect of using Paratone 400 Series additive, while the other pan shows the results with conventional viscosity index improver. The oil pans tell the story. The detergent inhibitor and the base oil used were the same.

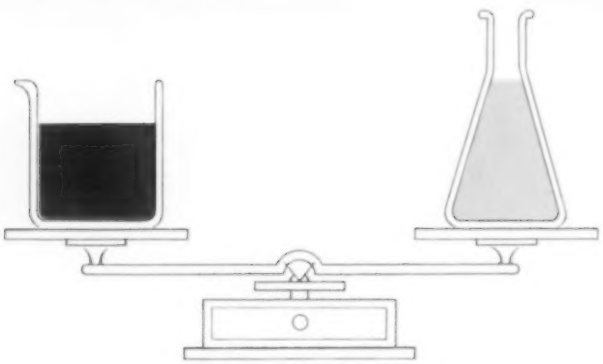
**Taxi piston shows** how well a Paratone 400 additive protected against ring zone deposits during the 25,000 miles.



**Oil screen clogging practically eliminated!** Here are two representative oil screens from the above Taxi Test. Note the dramatic difference . . . screen on the right with Paratone 400 Series additive is only 2% clogged. The clogged screen on the left resulted from an oil which contained a conventional viscosity index improver.

**Up to 50% better overall sludging performance** in taxi tests! You can expect this kind of result from recommended blends of Paratone 400 Series additives.

**Oils formulated with the Paratone 400 Series** product can easily meet the customer's specific requirements, including Ordnance qualifications.



## CALL UPON ENJAY FOR PRESCRIPTION-BALANCED ADDITIVES

**. . . Made to your exacting specifications . . .**
**Created to help you market your product SUCCESSFULLY**

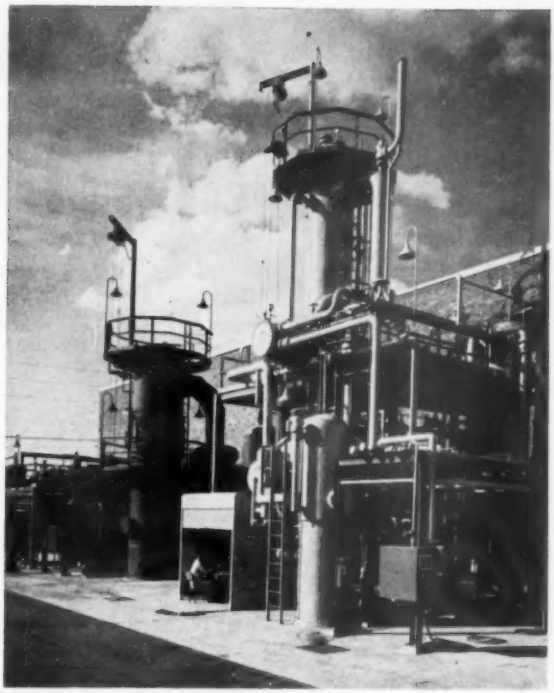
- Enjay serves you as a single source of the complete line of petrochemicals to improve your fuels and lubricants.
- Enjay maintains a larger technical staff devoted not only to developing new additives, but also to preparing specialized formulation to fit your specific needs.
- Quality control every step of the way from raw material to finished product is extremely important at Enjay to assure our customers of consistent high quality with each order.
- Deliveries are made from Enjay product centers throughout the country. They are expedited along the way by Enjay's new traffic control system.

The Enjay technical staff is available to help you meet your individual requirements in the additives field.

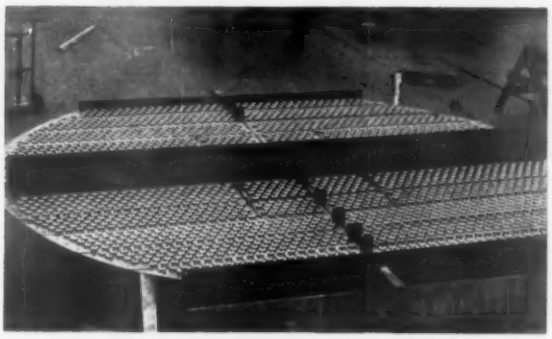
For the latest Technical Service Bulletin on the new Paratone 400 Series, or for more information on how a Prescription-Balanced Paramins Package can improve your product's performance — and effectively lower your treating costs — write or phone today

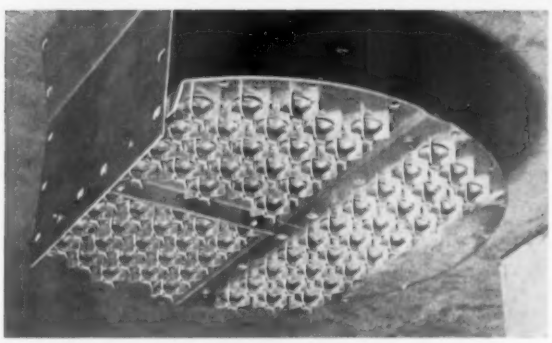
ENJAY

**ENJAY COMPANY, INC.,** 15 West 51st St., New York 19, N. Y.
Akron • Boston • Charlotte • Chicago • Detroit • Los Angeles • New Orleans • Tulsa
EXCITING NEW PRODUCTS THROUGH PETRO-CHEMISTRY



NEW DESIGNS in fractionation are derived from experimental work conducted on these units of Fractionation Research, Inc.





BALLAST TRAY (top) and FLEXITRAY illustrate the new concept in trays, replacing the conventional bubble cap tray.

In many cases, use of a better catalyst is all that is needed. But some refiners are also increasing the effectiveness of their units through a better distribution of the feed-streams—fresh feed and recycle—into the reactor, and through improvements in the motion process of the catalyst.

**Surprisingly, several refiners are still installing new cat reforming facilities, and improving existing cat reformer installations.**

It has been believed that the capacity for cat reforming had reached a limit, at least in the U. S.

**Many other process improvements were mentioned in answers to the survey.** Among them:

- Installation of crude desalting facilities—sometimes made necessary by the adoption of some further refining process. In several cases, the desalting equipment has been put in on a rental basis.
- Installation of a dewaxing unit, or entire wax plant.
- Installation of an acid alkylation plant.
- Modification of crude stills. In several cases, a vacuum section was installed, or improved. One foreign refiner converted an old thermal cracking plant to a combination topping and vacuum still.
- Improvement of coking units. One refiner credits his new radioisotope level-control in coke drums for a substantial increase in efficiency (PW—Oct.9'59,p76).
- Use of steam and air decoking equipment.
- Better liquid extraction processes, such as the Rotary Disc Contactor (RDC process) or the Podbielnak phenol extraction process.
- Installation of a naphtha splitter for gasoline quality improvement.

## Fast, Simple Equipment Pays

**More efficient equipment is a prime consideration in making changes toward cost reduction.**

The number of refiners in the PETROLEUM WEEK survey who credited new equipment for a substantial saving was almost as high as those who gave credit for the saving to their new processes. Many new trends are in evidence.

**For low or medium heat release, vertical tube furnaces are becoming increasingly popular among refiners, specially because they are less costly. In many cases, they can be shipped from the factory fully assembled.**

The matter, however, is still controversial with manufacturers who make both types of stills and furnaces—vertical and horizontal. One thing is certain: Several leading refiners have a set preference for the log-cabin type of still.

Heat-transfer rates are higher than they used to be. This is particularly the case where light products are being treated, with little or no coking tendencies. As a result, heaters can be made more compact.

Improved baffling, more appropriate location of burners, newer types of burners capable of better flame placement are responsible for a more uniform heat distribution.

Welded construction, which is cheaper, can now be used in stills that handle heavy products.

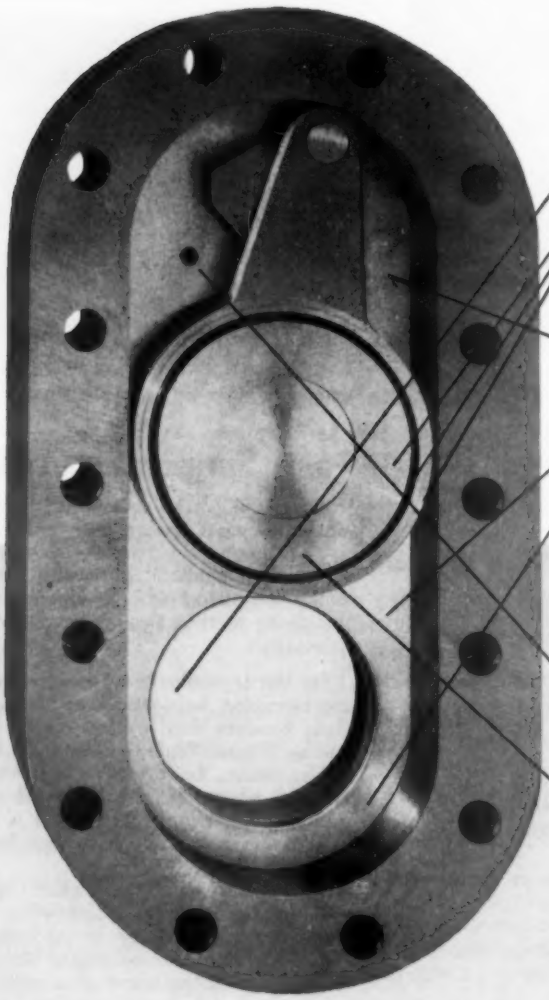
This is so because steam and air decoking replaces the conventional ramming.

**New designs of trays for fractionation and absorber**

**continued ▸**

GROVE
Series
**G-5**

# A new, with all the



**Full Opening**

**Protected Seal-O-Ring Design**—Unique Grove engineering places nitrile rubber O-rings and rugged metal seat rings on the gate, so that when in the open position, they are completely elevated away from foreign matter in the flow stream.

**Continuous, Perfect Contact**—Metal seat rings are firmly held in contact with polished and chrome plated body side plates to guarantee a continuous contact for scraping action through all gate positions. Squeegee action of the Seal-O-Rings maintains an immaculate surface on the side plates for perfect sealing.

**No Lubrication—Ever**

**Bleeder Plug**—Permits venting body cavity in closed position.

**Springs Behind Seat Rings**—Firmly hold both metal seat rings against polished body side plates.

**GROVE VALVE and REGULATOR COMPANY**
A Subsidiary of Walworth Corporation
**65th & Hollis Street, OAKLAND 8, California**
**HOUSTON 27—3203 Mercer St. • LOS ANGELES 6—2559 W. Olympic Blvd.**
**ODESSA • TULSA • DENVER • CHICAGO • NEW YORK • DALLAS • PITTSBURGH**
FARMINGTON, N. M. • LAFAYETTE, LA. • HARVEY, LA. • LONGVIEW, TEXAS
In Western Canada: GROVE VALVE LTD., EDMONTON

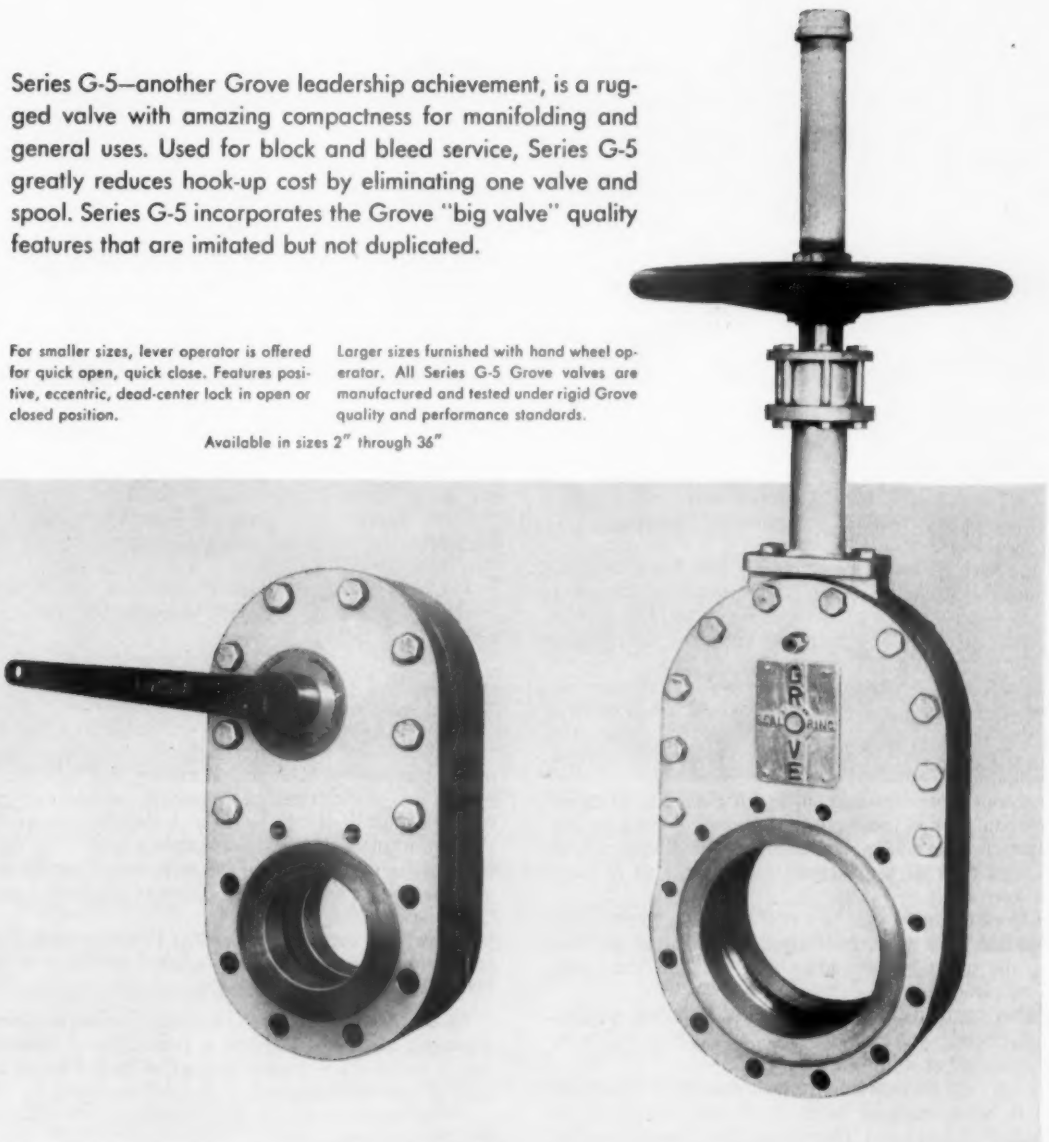
# more compact valve proven GROVE features!

Series G-5—another Grove leadership achievement, is a rugged valve with amazing compactness for manifolding and general uses. Used for block and bleed service, Series G-5 greatly reduces hook-up cost by eliminating one valve and spool. Series G-5 incorporates the Grove "big valve" quality features that are imitated but not duplicated.

For smaller sizes, lever operator is offered for quick open, quick close. Features positive, eccentric, dead-center lock in open or closed position.

Larger sizes furnished with hand wheel operator. All Series G-5 Grove valves are manufactured and tested under rigid Grove quality and performance standards.

Available in sizes 2" through 36"



SPECIAL REPORT $ COST REDUCTION IN **REFINING**

**AIR COOLING is applied to a variety of process streams in these batteries of seven Solo-Aire and four Combine-Aire sections made by Hudson Engineering Co. At left, a minimum of water is brought into the picture to reduce temperature further.**

**towers are responsible for substantial lower initial costs, greater simplicity, easier maintenance, increased capacity, and better flexibility.**

In no piece of refinery equipment has there been as radical a substitution of scientific knowledge for empirical design as in the trays for fractionation towers. Nearly all the refiners surveyed said they were making some changes in tray and tower design.

The need for more knowlege about these essential components of nearly every refinery process became evident a few years ago. In 1954, several refining, chemical, and engineering companies joined efforts to form Fractionating Research, Inc.

This cooperative organization, which today has 58 member companies, has conducted an intensive program on fractionation, in Alhambra, Calif., where experimental towers were built for the purpose.

The program is still going on.

The work is carried out by a staff of six engineers. They have studied the hydraulics of what goes on inside of these towers, the spacing and loading of trays, and their individual efficiencies.

Member companies receive all of the technical information developed, and are granted royalty-free rights to patents owned or controlled by FRI.

As a result of these studies, the conventional bubble-cap design is being replaced by more efficient trays, such as the Shell Turbogrid and Thermagrid, the Socony Uniflux, the Koch Flexitray, the Glitsch Ballastray, the Stone & Webster Ripple Tray. Some of these are equipped with floating valves over the vapor slot openings, for better flexibility at various rates.

The principal purposes of all these new designs are:

- To minimize the amount of liquid that is entrained with the vapor.
- To keep pressure drop through the tray as low as possible.
- To increase the capacity of the tower.

Throughput increases of 100% or more have frequently been obtained as a result of a change in the type of trays used, according to both manufacturers and refiners.

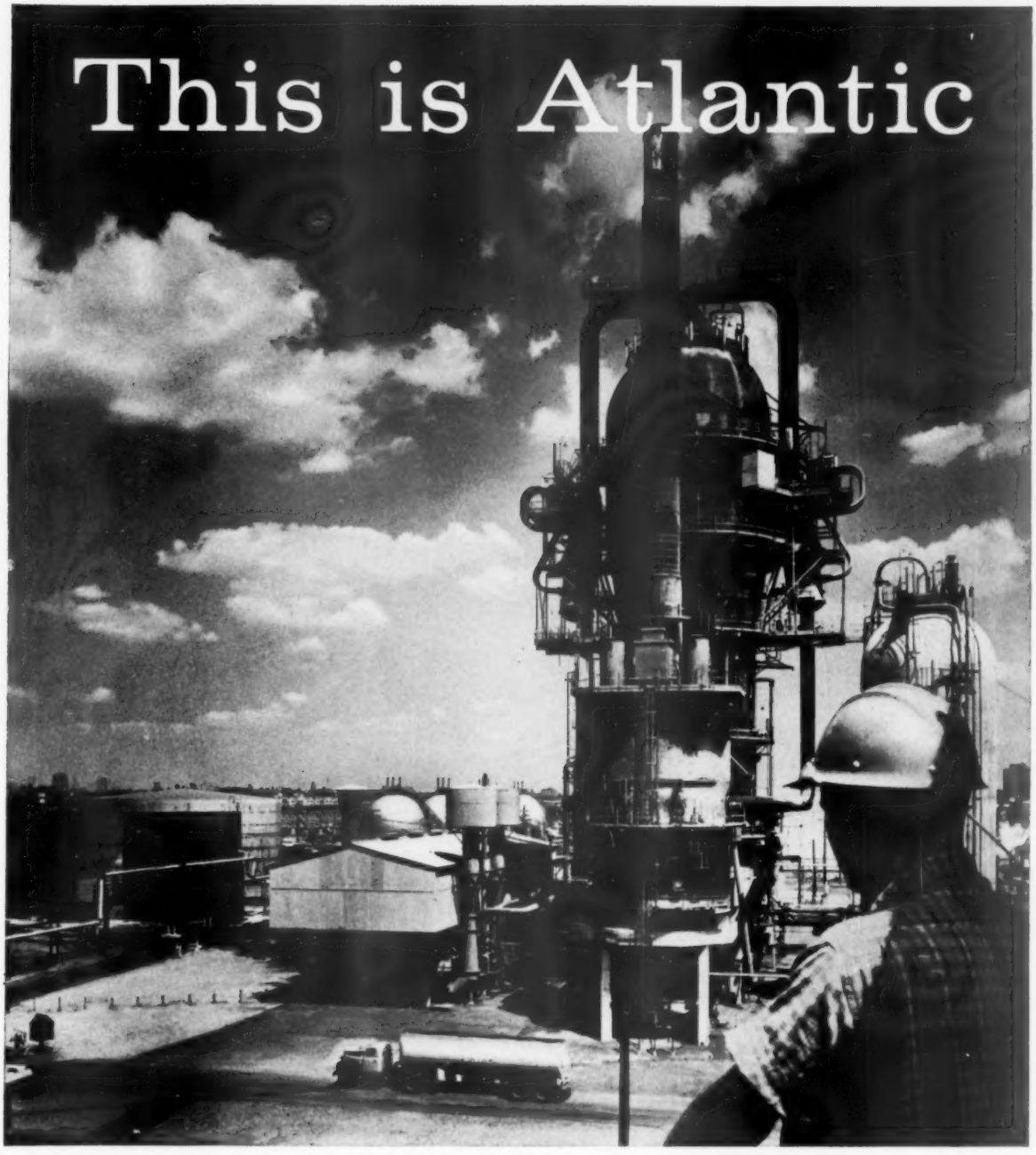
The use of electronic computers is contributing greatly to the design of fractionation and absorber towers. Exact calculation of tray-to-tray heat balance is the only rigorous method for correct design. Because these calculations are extremely long and tedious, short-cut methods have had to be used in the past.

With the use of computers, however, the rigorous calculations can now be accomplished within a matter of just a few hours.

**To curtail the high expense of cooling-water corrosion damage, a noticeable trend is taking place towards the use of fin-tube air coolers instead of conventional water-cooled heat exchangers.**

Where water is not readily available, air cooling is the obvious solution.

# This is Atlantic



REFINING: At Point Breeze, Philadelphia, and at the Atreco Refinery, Port Arthur, Texas, Atlantic applies its 89 years of refining experience to the needs of the motoring public. NEW ATLANTIC IMPERIAL GASOLINE, the latest development of advanced research and refining skill, offers new power *and* more economy for today's high-compression engines.

ATLANTIC

THE ATLANTIC REFINING COMPANY

*Producer, refiner and marketer of quality petroleum products*

# Auto's poison, jet plane's meat..

Low-grade paraffins in auto fuel that used to reduce octane rating had to be left in because there was no economically feasible way to get them out. But not any more. Molex*, a new continuous process developed by Universal, successfully removes them, greatly increases octane rating of auto gasoline.

But now comes an amazing plus value . . .

These unwanted components of auto fuel make a terrific new fuel for jets! Highest in heat-value-per-pound among hydrocarbon fuels, and available in almost unlimited quantities, they transmit more energy, burn with a cleaner, cooler flame . . . bid fair to save the airlines and military some millions of dollars on annual cost of overhauls!

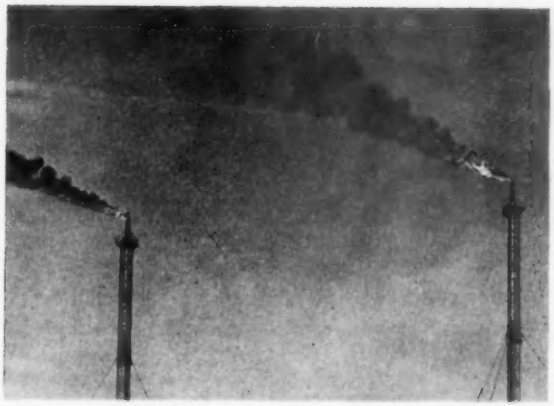
Performing all kinds of near-miracles to create many kinds of petroleum products is the day-to-day function of UOP research . . . the benefits of which are shared by petroleum refiners and users throughout the Free World.

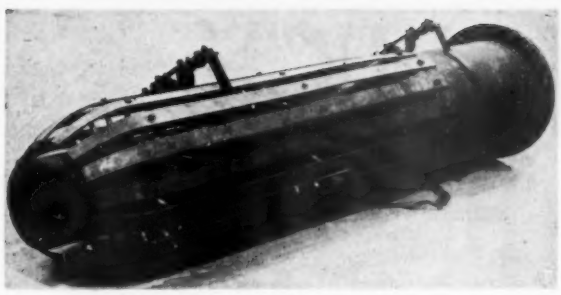
*Trademark

UOP

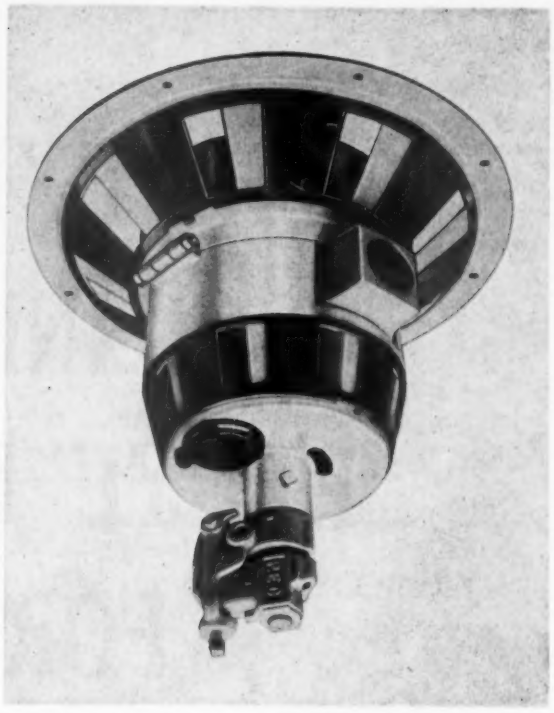
**UNIVERSAL OIL PRODUCTS COMPANY** 30 ALGONQUIN ROAD
DES PLAINES, ILLINOIS, U. S. A.

*More Than Forty Years Of Leadership In Petroleum Refining Technology*





**WIND DEFLECTOR on this flare stack burner should give longer life to burner head. It eliminates flame depression due to wind action which formerly caused distortion and burning of stack tip. British Petroleum Co. developed it.**



**GREAT ECONOMY characterizes this natural-draft oil and gas burner, latest design of Peabody Engineering Corp. primarily for vertical firing. Proper flame placement and good flame stability are obtained by correct admission of air.**

But air cooling is being adopted now even where there is an ample supply of water, in an effort to do away with the corrosion problem, as well as with the disposal of treated refinery water.

In existing refineries, where there is generally but little space available, the substitution of air cooling for water heat exchangers has limitations, because air coolers are more bulky. Air cooling offers no problem, however, where there is ample space. Air cooler manufacturers say that installation costs of fin-tube units, including variable-speed fans, are no higher than for water heat exchangers, when the cost of water pumps, piping, and cooling towers are taken into the picture.

In certain cases, especially in warm countries, aircooling must be "trimmed off" with a minimum of water-cooling, and units are now available that combine these two processes.

**Most refiners are cutting costs by standardizing equipment and cutting down spare parts inventories. Pumps are a typical example.**

Entire series of pumps of the same model but of different sizes are being manufactured with identical component parts, except for the case and the impeller, to allow the greatest degree of interchangeability.

Refiners, on their part, are trying to reduce to a minimum the number of pump models in their plants. The general simplification that should result from these joint efforts may pave the way to a standardization of parts within the pump industry.

Pacific Pumps, Inc., one of the Dresser Industries, has just completed a study, with the help of an electronic computer, of the spare parts being ordered by clients. The frequency of orders for each part has thus been determined allowing the company to be better prepared for emergency orders. The calculated risk involved when a refiner carries in stock a limited number of parts can also be figured.

There are indications that a similar standardization is being sought among manufacturers of other equipment used in refineries—for example, heat exchangers.

**Manufacturers today can supply their customers faster with the spare parts they require. This is a further source of cost reduction,** as spare parts inventories can be reduced as a result of this service.

Closer coordination between refineries of the same company also contributes to such a saving. For example, one company with several refineries in England stores a single expensive piece of machinery, as a spare, in one refinery. It is available, however, to any of the other plants of that company that may need it.

**An outstanding cost-cutting trend in refineries today involves the increasing use of high-speed, high-capacity, centrifugal compressors.**

Centrifugal compressors were used originally for very pure gases only. But they are being used more and more for refinery gases carrying an appreciable amount of im-

**continued ▸**

# THE EXPANDING LINE OF "ETHYL" PRODUCTS FOR THE PETROLEUM INDUSTRY

**Ethyl offers a broad and expanding line of products —all of them a result of 36 years of research, development and close association with industry needs.**

## ANTIKNOCK COMPOUNDS

Since Ethyl discovered the antiknock action of tetraethyllead 36 years ago, intensive research has been carried on to find a better antiknock. One result is Ethyl's new manganese compound, making possible the new formulation—Motor 33 Mix—recently announced as an addition to Ethyl's line of antiknock compounds.

33 Mix improves gasoline's response to tetraethyllead. This makes possible higher antiknock quality at lower cost and offers a wider range of refining flexibility. In most cases, it will be to the refiner's advantage to review his octane improvement costs in the light of this new formulation.

33 Mix permits increased use of natural gasoline or virgin light naphtha, thereby economically improving road antiknock performance. It may also enable refiners to reduce the amount of aromatics in gasoline through less severe catalytic reform-

ing. This produces better road performance and increased gasoline yield.

Studies of current fuels show that in many cases, additional octane improvement can be obtained at costs considerably lower than by processing. Greatest improvement is with fuels with moderate sensitivity and aromatic content.

33 Mix offers refiners a new reserve of chemical octane numbers—a new opportunity to study future plans, which may delay or eliminate capital investment for purchase of equipment for octane improvement.

## OTHER ADDITIVES

Ethyl's broad and growing line of additives for petroleum products also includes the following:

**Ignition Control Compounds**—A choice of phosphorus additives to match your own particular needs. Also, a new one that shows great promise—available in development quantities.

**Multi-Purpose Additive**—Detergent, anti-icing, anti-corrosion agent. Safe and easy to handle. Costs less than a penny per barrel of gasoline.

**Antioxidants**—A growing number of highly effective antioxidants from Ethyl's ortho-alkylation development. Now available in commercial quantities:

**701**—For motor and aviation gasolines, jet fuels, industrial oils.

**702**—For crankcase oils for both gasoline and diesel engines—also for automatic transmission fluids and industrial oils; offers unique anti-wear properties.

**703**—For greases and synthetic jet-engine oils. Imparts alkalinity, dispersancy, anti-rust, anti-wear properties.

**733**—For motor and aviation gasolines, jet fuels, industrial oils. An easy to handle liquid.

**712, 720, 736, 762**—Four new antioxidants now available in development quantities—for various applications in the petroleum field, as well as in rubber and plastics.

**Diesel Ignition Improver**—An effective, economical cetane improver for diesel fuels. Other alkyl nitrates are available for monopropellants.

**Oil Soluble Dyes**—Available in all basic colors and in powdered, beaded, flaked, or granular forms. Also as liquid concentrates.

## PRODUCTS FOR THE PETROCHEMICAL INDUSTRY

Ethyl's accumulative experience and know-how in the field of organometallic chemistry is resulting in an expanding line of new products for the petrochemical industry.

**Aluminum Alkyls and Alkyl Aluminum Halides,** for example, are being used as effective catalysts for the polymerization of olefins. Certain aluminum alkyls show promise as chemical intermediates for the manufacture of long-chain alcohols and alpha-olefins; also as pyrophoric fuels for military applications.

**Alpha-Sodio Sodium Acetate**—another interesting organometallic chemical—shows possibilities as a low-cost intermediate for organic synthesis.

And Ethyl's ortho-alkylation development, which has made possible our line of antioxidants, has opened up a whole new series of chemical building blocks. This unique reaction offers the means of synthesizing many new chemicals for synthetic resins, plasticizers, surface-active agents, dyestuffs, pesticides and other products.

• • •

Ethyl Representatives will be glad to furnish data on all these products, or arrange consultation with Ethyl specialists to discuss the application of these products in your business. The complete line is backed by Ethyl service—one of the many advantages of buying from Ethyl.

**ETHYL CORPORATION** NEW YORK 17, N. Y. • TULSA • CHICAGO • LOS ANGELES
ETHYL CORPORATION OF CANADA LIMITED, TORONTO • ETHYL USA (EXPORT) NEW YORK

purities, without harmful effects to the compressor blades. Oil is frequently injected with the gas to keep the machine clean.

Clark Bros. Co., one of the Dresser Industries, cites these advantages in favor of the centrifugal machines—up to 7,500 hp.—over reciprocating compressors (which it also supplies):

- They are much more compact. One centrifugal compressor easily does the work of five reciprocating machines.
- They are considerably more flexible than the reciprocating compressors. Product can be either bled out, or injected in, at various stages of a multistage centrifugal compressor.
- Maintenance cost is considerably lower. Centrifugal compressors will run for years without attention.
- The product handled in a centrifugal compressor suffers no contamination from lubricating oil.
- The centrifugal compressor has a lower installation cost.

The principal objection to the centrifugal compressor is its initial cost, which is substantially higher, especially for low capacities. Yet centrifugal compressors down to 300 hp. are being installed in refineries today because of the saving in space and operating cost.

Multistage, turbodriven compressors, with opposed impellers to ease the thrust on the shaft, are being offered today with compression ratio of 4 to 1 and discharge pressure of 115 psi., in sizes from 1,000 to 8,000 hp. Inner cooling, between stages, brings the efficiency of these machines remarkably close to the isothermal cycle. In refinery practice, impeller tip velocities up to 860 ft. per second and speeds from 3,000 to 15,000 rpm., with efficiencies around 84%, are considered very satisfactory.

**Closer integration of successive refinery processes is resulting in less need for costly storage tanks.**

Intermediate storage between processes can frequently be eliminated entirely if the flow of products through the refinery is so regulated as to make each process dependent upon the timing of all others. Computer calculations can make a notable contribution to setting up this flow-through.

An added cost advantage of the elimination of intermediate storage tanks is that the product being processed retains its heat when passing from one process unit to the next; no reheating is needed.

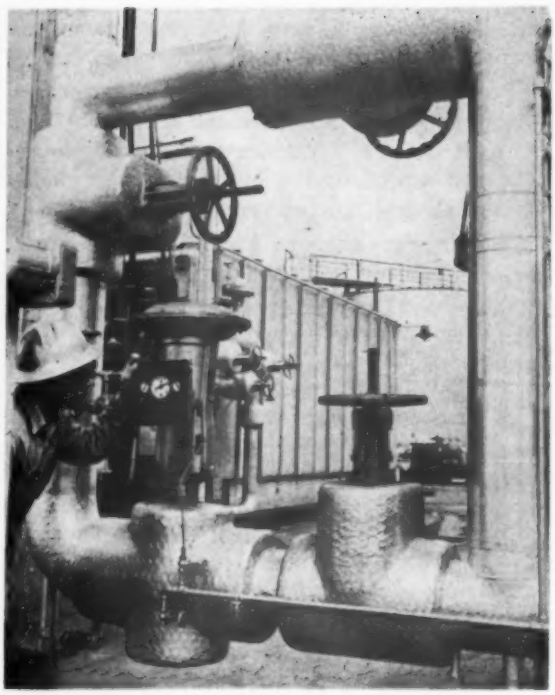
The practice of eliminating intermediate storage tanks is not without its drawbacks, however. The most obvious is that the entire refinery suffers, and may even have to be shut down, when one process unit fails.

Furthermore, as no process can be stopped without a corresponding stoppage of the others, turnarounds must be scheduled in such a way that the entire refinery can be subjected to turnaround at the same time.

One large eastern refinery, to overcome such disadvantages and still retain the economic advantages of integration, has installed a small number of safety tanks, into which a product can be diverted in case of the failure of a unit without jeopardizing the operation of other units.

**Closer integration likewise simplifies the design of refinery piping systems, with resulting reduction in cost.**

Here again, the use of electronic computers, generally located in the office of the engineering firm that builds the plant or the new process unit, is making it possible to design piping layouts that are mathematically correct, at a substantial saving.



**PNEUMATIC CONTROL, by American Machine & Metals, operates valve to monitor process temperature or pressure.**

## Swing to Automation Is Slow

**The trend towards more automation of processes, in an effort to reduce manpower and improve product quality, has brought about more and better instruments.**

This automation may be of the conventional mechanical type, or of the more sophisticated electronic type.

In the first case, an analyzer or a pressure- or temperature-measuring instrument is connected electrically or pneumatically to a mechanism which automatically opens or closes a valve to maintain constant certain characteristics of the product.

In the case of automatic control involving electronic computers, the procedure is much more complicated. Instead of responding to the variations of one or, at the most, two variables, the control must take into account a great number of variables, some of these integrated with other processes in the plant. Instead of a simple response, a choice between several actions is offered to the control instrument. It must make a selection, in line with a programming procedure carefully prepared beforehand.

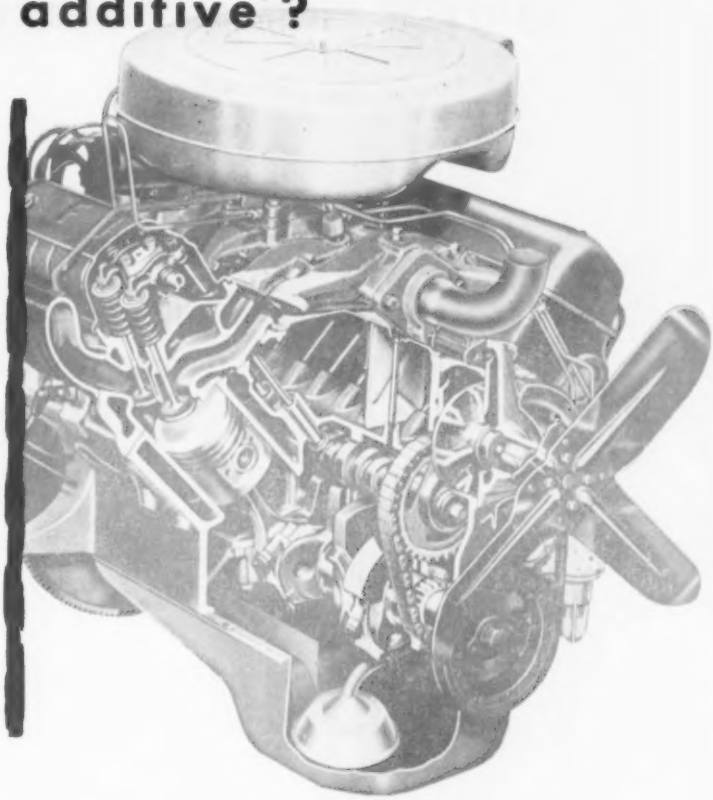
**The inherent complication of electronic control applied to a refinery process is the reason why so few have been put in operation up to now.** But work toward that end is being pushed actively by many refiners.

"It is difficult to estimate the exact saving that can be attributed to modern control instrumentation," says the product control engineer of a major refiner, "because it affects so many features of a refinery. It saves countless

**continued ▸**

# considering CYCLOHEXANONE as a lube-oil additive*?

**get a test-sample of National NADONE® (CYCLOHEXANONE)**



"The highest quality you can get . . . in any quantity you can use"—that's the simple twelve-word story of National NADONE (Cyclohexanone). It has every desired attribute for lube-oil use.

Made in a modern new plant by our direct process from basic Allied Chemical raw materials, NADONE has exceptional solvent power and exceptional purity, too. (99.7% minimum)

We'll gladly send a generous test-sample quantity for your lab work and our 32-page Technical Bulletin I-19 containing complete properties and a wealth of other valuable data.

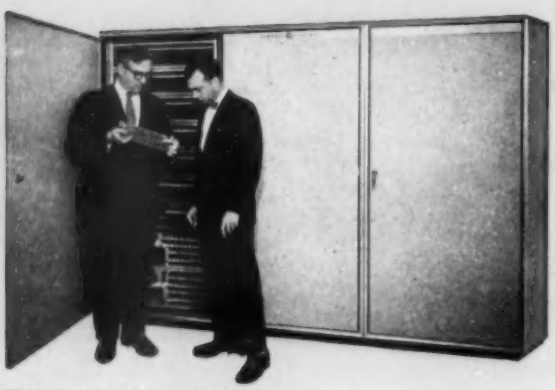
* as described in U.S. Patent 2,389,608.

**NATIONAL ANILINE DIVISION**
40 RECTOR STREET, NEW YORK 6, N. Y.
Atlanta Boston Charlotte Chicago Greensboro Los Angeles
Philadelphia Portland, Ore. Providence San Francisco
In Canada: ALLIED CHEMICAL CANADA, LTD., 100 North Queen St., Toronto 18
Distributors throughout the world. For information:
ALLIED CHEMICAL INTERNATIONAL • 40 Rector St., New York 6, N. Y.

Allied Chemical

## COMPUTER PROGRESS FROM GENERAL ELECTRIC

# ANNOUNCING THE FLEXIBLE NEW GE 312 DIGITAL CONTROL COMPUTER FOR ON-LINE PROCESS COMPUTING IN THE PETROLEUM AND CHEMICAL INDUSTRIES



GE 312 DIGITAL CONTROL COMPUTER

GENERAL ELECTRIC PROCESS CONTROL AUTOMATED BY GENERAL ELECTRIC

**Newest member of a distinguished family of General Electric computers, the GE 312 *transistorized* DIGITAL CONTROL COMPUTER has been especially designed for process control, data logging, and data processing in the petroleum and chemical industries.**

**• "Big Machine" features—moderate in cost • Expansible memory capacity • Easily programmed • Advanced programming aids available • Rugged construction for industrial application • Off-line operation as a general purpose computer**

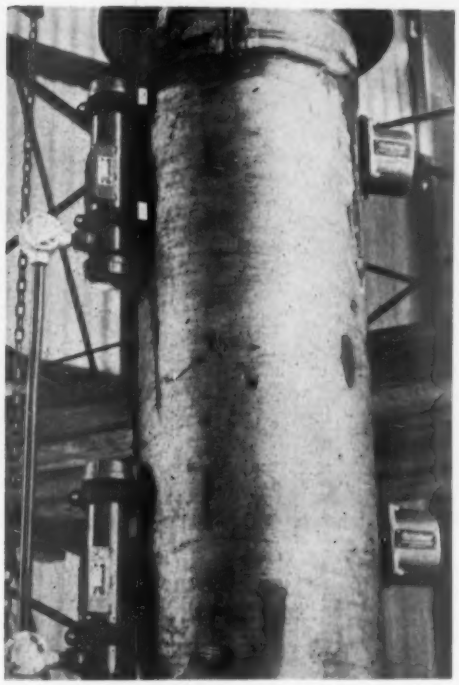
**Request brochure CPB-36A. For more information on computers, computing control and automation, contact your nearest General Electric Apparatus Sales Division Office, or write to: Computer Department, Room 7 General Electric Company • Deer Valley Park • Phoenix, Arizona.**

*Progress Is Our Most Important Product*

**GENERAL ELECTRIC**

FOR FIGURES IN A HURRY—FIGURE ON A GE COMPUTER

AUTOMATIC BLENDING and packaging simplifies layout and reduces costs in this installation by Blaw-Knox Co. for a refinery grease plant.



"ACCURAY" ISOTOPE DETECTOR combination automatically controls level in refinery coke unit.

hours of manpower at the unit as well as in the laboratory, and it improves the quality of the finished products. But it also reduces the chances of making off-specification intermediates, which require elaborate corrective measures throughout the plant."

**Electronic computers are used extensively to optimize refinery operations all over the world.**

"It is estimated that it would take two men two to three years to make a complete refinery optimation study," says the manager of the operations research section of a major refiner. By the time it's completed, he added, "the work done would in most cases be out of date. But by using a computer, the same two men needed only two months from the start of setting up the program until the issuance of the final report. Once the linear programming is done, the task of the computer is easy and fast, and the report can be completed in about an hour.

Such a program helps the refiner to find the operating conditions which will yield the maximum obtainable profit.

"Using a little ingenuity," the manager adds, "gives you limitless possibilities. The computer will answer for you such tricky questions as: How will seasonal changes affect vapor pressures? Shall a piece of equipment be used or bypassed for most economical operation? What is the break-even manufacturing price of a product? To what extent can the capacity of a process be increased?"

**Instrumentation of quality-control operations are resulting in savings both in the control laboratory and in the actual operation of the plant.**

The days are gone when quart or gallon samples of products had to be lugged to the control laboratory for elaborate, time-consuming physical and chemical analyses. Today, control analyses are made "on stream." When some of the product needs to be diverted from its stream for analysis, a minute quantity, on the order of 0.1 cc., is sufficient.

Such properties as specific gravity, viscosity, flash point, even distillation temperatures, are being tested right at the process unit, and recorded automatically.

Qualitative and quantitative analyses of stream composition can be monitored with on-stream chromatographs and mass spectrometers.

This new instrumentation has the added advantage of cutting down the need for skilled technicians to perform simple analyses: Under supervision of an unskilled employee, the instrument now performs delicate analyses accurately, rapidly, and with complete reproducibility.

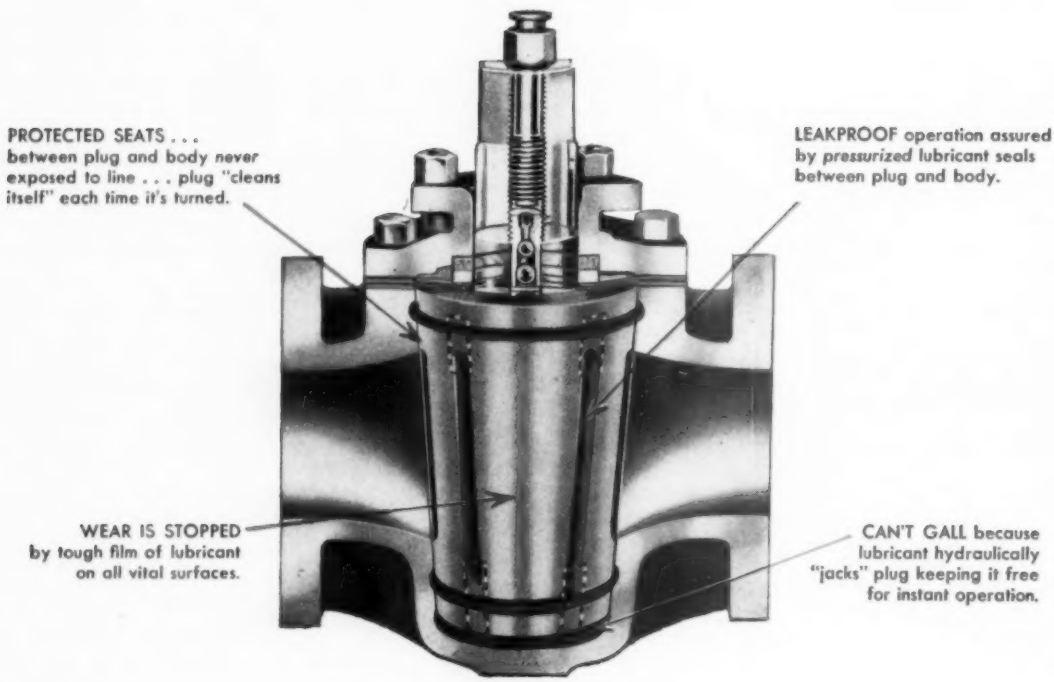
**Increased automation of blending facilities has cut costs sharply in the accurate blending of gasolines, and in the packaging of greases and lubricating oils.**

The development of special units for proportioning fluids automatically, for stream-blending controlled quantities of additives, for metering and recording flows accurately, has made it possible to simplify enormously the installations required for the blending of gasoline and the processing of lubricants.

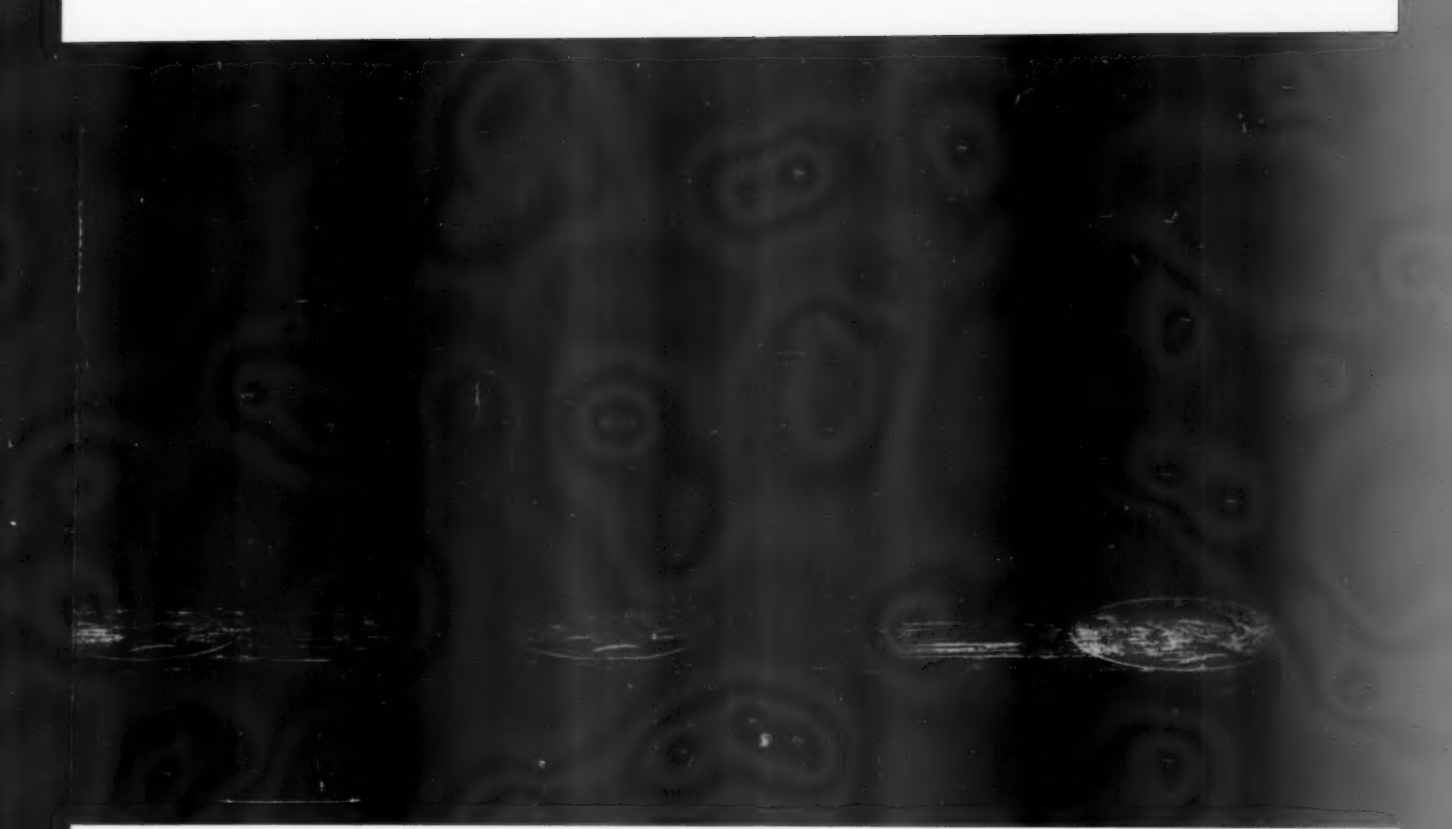
Refiners say that such installations generally pay off within 18 to 24 months. The blending plants themselves can be made considerably simpler than for manual control (in some cases six filling lines are installed where 20 separate lines were formerly used), and the manpower required is much lower.

continued ▸

# Make valve dollars go


PROTECTED SEATS . . . between plug and body never exposed to line . . . plug "cleans itself" each time it's turned.
LEAKPROOF operation assured by pressurized lubricant seals between plug and body.
WEAR IS STOPPED by tough film of lubricant on all vital surfaces.
CAN'T GALL because lubricant hydraulically "jacks" plug keeping it free for instant operation.

*Lubrication makes the*



# farther with

# LUBRICONOMY

"Lubriconomy" is a streamlined way of saying that valve lubrication *is* economy . . . it saves money by eliminating wear.

Lubrication in Rockwell-Nordstrom valves will make your valve dollars go farther because it eliminates the wear of metal-to-metal friction on *every* moving part. Comparing these valves to other types is simply comparing a lubricated to a non-lubricated mechanism . . . which would you expect to work better, longer and at lower cost?

But lubrication in Rockwell-Nordstrom valves does more than eliminate wear—it assures extraordinary leak-proof control and dependability. *Pressurized* lubricant in the exclusive Sealdport® system creates a powerful double seal against leakage. (Much like a puncture-proof tire, pressurized lubricant sealing "heals itself" if cut, scratched or worn). And lubricant also hydraulically cushions the plug to keep it free for *instant*, quarter-turn operation.

More than *6 million* Rockwell-Nordstrom valves are saving money today on every imaginable type of service. Why don't you try just one where you've had valve problems? Write for details, or have a Rockwell field engineer visit you. Rockwell Manufacturing Company, Pittsburgh 8, Pa. Canadian Valve Licensee: Peacock Brothers Limited.

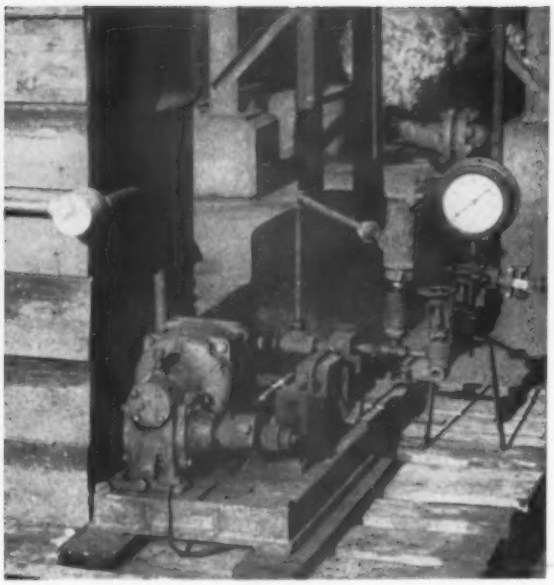
*difference*

ROCKWELL-Nordstrom VALVES

another fine product by

ROCKWELL

CORROSION DAMAGE such as this—on absorption tower caps—can be checked substantially by use of correct . . .



. . . INHIBITOR INTRODUCED into low-temperature portions of process unit by injection equipment such as this.

## Corrosion: Costly Headache

**The most promising and yet most baffling cost problem that faces operators is that of reducing corrosion damage in their refineries.**

"The toll that corrosion takes yearly in material and man-hours is hard to estimate," a corrosion engineer for one major told PETROLEUM WEEK, "because it is nearly impossible to set an accurate figure on the cost of a shutdown. Not only the one unit is shut down, but the entire refinery is affected."

"In the final analysis," says the chief engineer of a leading engineering company, "when it comes to combatting corrosion in a new piece of equipment, it's a tossup between the engineering and the operating departments. The man who will operate the unit wants to minimze maintenance trouble and cost; the man who designs it wants to minimize initial investment. One will favor the use of corrosion-resistant alloys; the other will lean toward a less costly construction, and a more extensive use of inhibitors."

**Inhibitors are effective for many corrosion-control applications, although their effectiveness cannot be quantitatively measured.**

Inhibitors, in small concentration, produce a thin chemical film on the metal. They are frequently high-molecular-weight organic amines. They are used in low-temperature portions of fractionation towers, catcrackers, debutanizers, and strippers, and are relatively inexpensive. But the cost of the equipment needed for their introduction into the process is by no means negligible.

**While inhibitors are of great value to protect the low-temperature portions of a refinery, alloys are necessary to resist high-temperature corrosion.**

One trick is to substitute inside insulation for outside insulation: A refractory lining is made to bear the brunt of high-temperature contact with the product, while the metal shell, at a much lower temperature, needs a much lower degree of protection.

The use of alloy-clad steel, instead of solid alloys, can often reduce the cost of construction of a corrosion-resistant unit. In many cases, according to Lukens Steel Corp., one of the main producers of such alloy-clad materials, they offer advantages that solid alloys lack, particularly when elaborate shaping and welding must be done. But, warns the manager of a large eastern refinery where such material is used extensively, "if you decide on alloy-clad construction, it is essential that the alloy selected be of the highest quality—nothing below 12% chrome."

**A promising development that is making rapid inroads in refinery construction technique is that of "diffused aluminized coatings."** Their principal use so far has been in portions of refinery units that come into contact with hydrogen. Their application to pretreating units in catalytic reforming operations has reduced materially the enormous quantity of scale that was being formed and blown into the reactor.

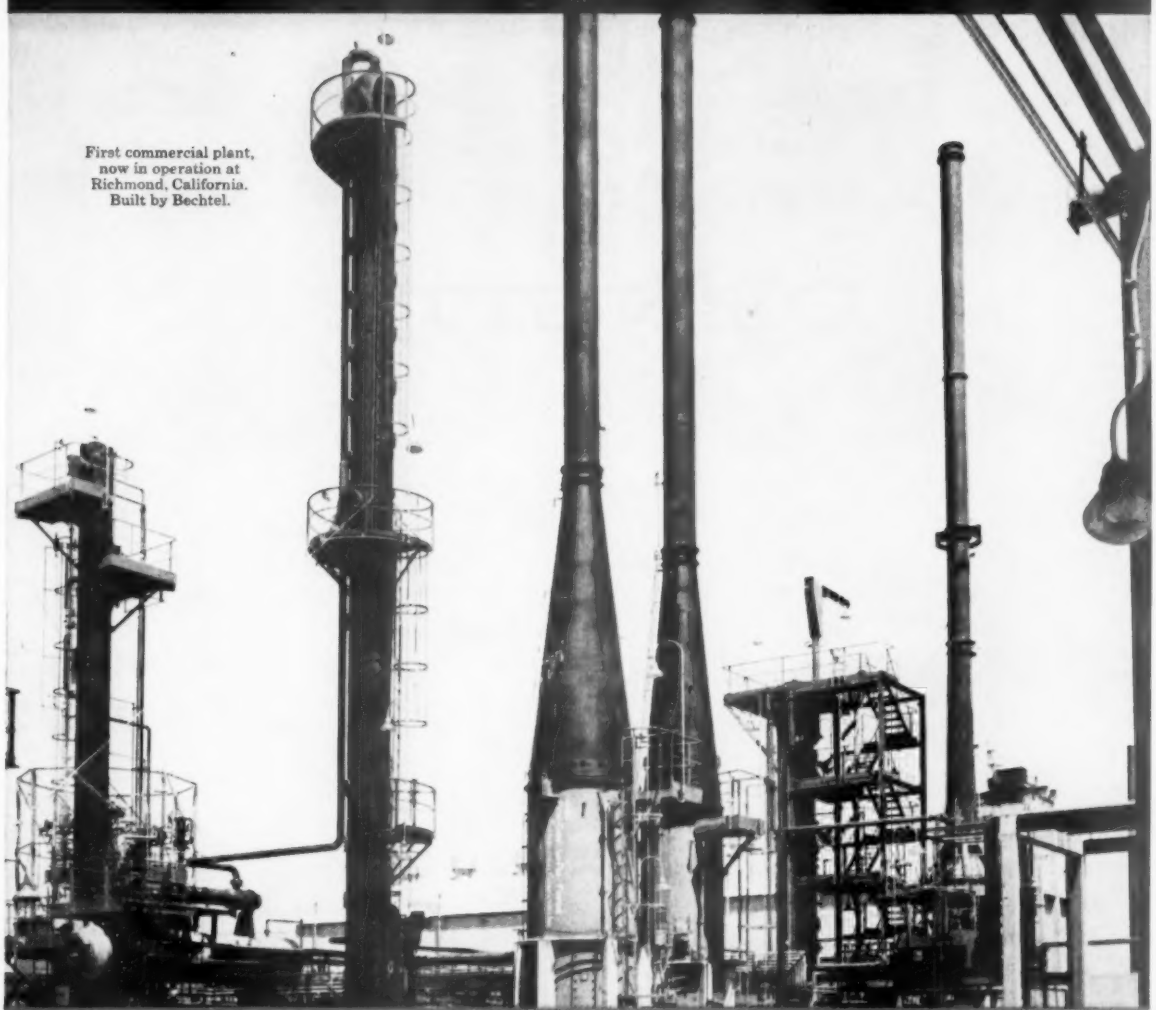
The technique is now being tried in a Middle West refinery inside of delayed coking drums, which are subject to severe corrosive conditions. The results of that experiment are being followed with interest by other operators.

**The use of low-voltage, direct-current electricity for the electrolytic protection of metals against corrosion is spreading.**

As opposed to the well-known cathodic protection, a new process of anodic passivation, called Anotrol, has just been made available by Continental Oil Co. Using a platinum cathode, and a current carefully regulated by a newly developed potentiostat, the technique protects the metal by maintaining over it a thin film.

**continued ▸**

# ISOCRACKING* is here!



First commercial plant, now in operation at Richmond, California. Built by Bechtel.

## LET BECHTEL show what this versatile hydrocracking process can do for you

**ISOCRACKING PLANTS** are available immediately through Bechtel Corporation and affiliated Bechtel companies—licensed to process design, engineer and construct plants employing this advanced new technique by its owners and developers, California Research Corporation.

BECHTEL

Your inquiry is invited.

**BECHTEL CORPORATION**

*Engineers and Builders for Industry*

SAN FRANCISCO

Los Angeles • New York • Houston

*Proprietary name of California Research Corporation

BALANCED DENSITY

DENSITY BALANCED

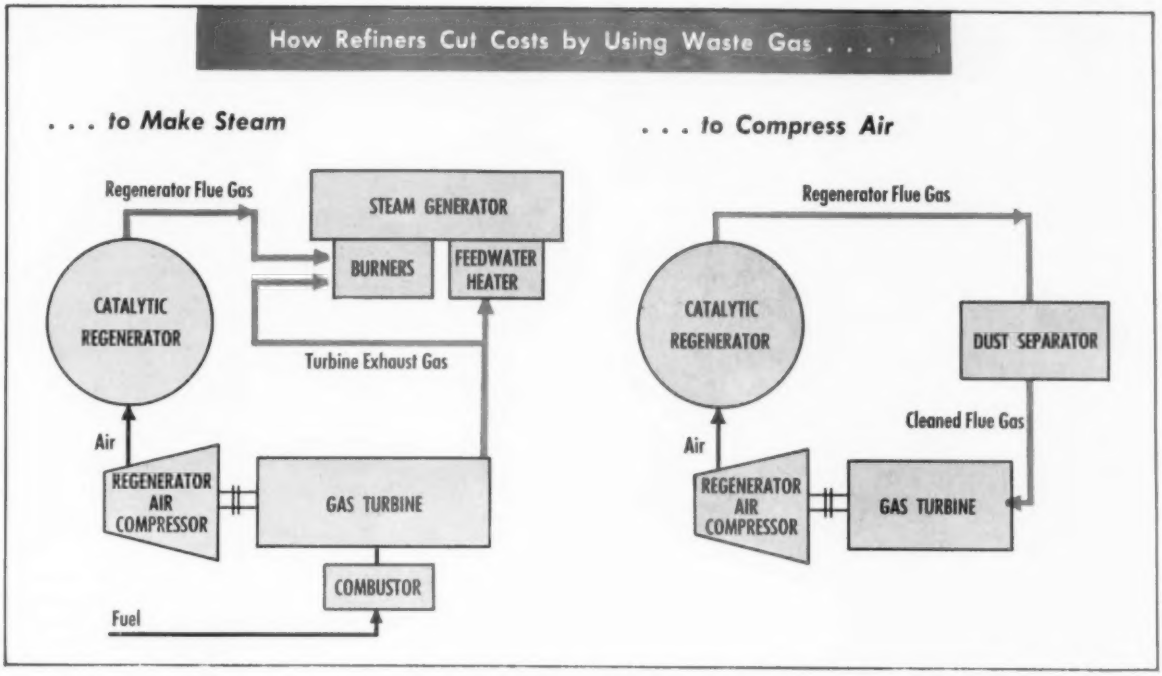
BALANCED DENSITY

DENSITY BALANCED

Davison *balanced density catalysts* save you dollars. Davison balances density against particle size distribution and catalytic stability, with all the precision of a tightrope walker to give you maximum activity maintenance and regeneration efficiency.

*Here is why.* Controlled pore size results in lower air consumption per unit of coke burned —lower residual carbon—lower $CO_2/CO$— greater resistance to thermal deactivation. Write Dept. 4126 now for your copy of Davison Product Service Bulletin No. 59-104.

**W.R. GRACE & CO.**
**DAVISON CHEMICAL DIVISION**
BALTIMORE 3, MARYLAND




GAS TURBINE is efficient in two cases only: When it can be driven by exhaust gas, or when its exhaust gas can be used.

## The Power Makes a Difference

**Many refiners find that they can cut operating costs by going to a more economical source of power. And 25% of those surveyed say they are going to the exclusive, or almost exclusive, use of electricity.**

Whenever economically possible, the trend is towards purchased electricity. This is particularly advantageous where a public utility plant is so situated as to permit an exchange agreement with the refinery. The refinery then supplies the fuel—heavy residue or petroleum coke—and the power company supplies electricity, sometimes steam, and even treated water, for processing purposes (PW—Jun.5'59,p44).

**Electric motors today are far more satisfactory than they were ten years ago—more rugged, better insulated, safer.**

More liberal safety codes, and developments in motor enclosures and cooling systems, have simplified and reduced the cost of installation and maintenance of electric motors. Furthermore, electric distribution within the plants is more reliable: Electrical disturbances or interruptions are few and far between. The distribution system, radial for greatest economy, can be easily converted, to secondary-selective for example, in case of subsequent expansion and increase in demand.

Since the maximum speed of 60-cycle motors is only 3,600 rpm., however, setup gears are needed to drive equipment—such as pumps or compressors—with speeds ranging up to 12,000 rpm. It is therefore essential that the combination of the motor plus its gear be taken into account when determining what is the most economical installation.

**When all the electricity is purchased, there is a strong tendency today to produce the steam needed in many refinery processes in small, compact, packaged boiler units.**

These can be either the conventional firetube type, or the newer watertube units. These packaged boilers have long been popular for space heating, and in many other processing industries; they have now been accepted in refineries, since they can burn fuels all the way from gas to residual oil so heavy that it must be preheated to 500F.

**When electricity cannot be economically purchased, and a power plant must be installed, latest trend indicates greatly increased steam pressures and temperatures, for greater efficiency and smaller equipment.**

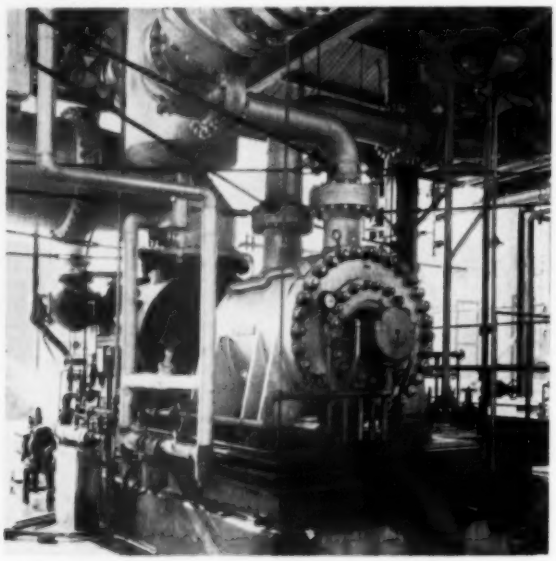
The initial cost of a high-pressure boiler is high, but this is often offset by subsequent reduction in operating costs. After having been satisfied with 600-psi. pressure units for years, refiners are now considering 1,000-psi. designs, together with all the plant improvements that such higher pressures involve.

The adoption of high-pressure boilers requires that the water used in the refinery be treated more elaborately.

**The question of water treatment, whether for boiler feed-water or for cooling purposes, is one of constant concern to the refiner: An adequate water system is a wise insurance against high plant maintenance costs.**

Correct treatment of feedwater for high-pressure boilers includes filtration, demineralization—for example, by ion-exchange—and desilicification. The removal of silica, in particular, is receiving a great deal of attention today because, at high pressure, silica in the water volatilizes and

**continued ▸**



EXHAUST STEAM from this 3,000-hp. turbine is used as process steam. It drives a vertically-split Ingersoll-Rand centrifugal compressor, handling hydrogen-rich gas in a refinery.

TURBOPUMPS operate at speeds from 5,000 to 12,000 rpm. and pressures up to 1,500 psi. with a single stage. The turbine end may be used as an efficient driver for other machinery.

passes with the steam into the turbine, where it makes hard, glassy deposits on the blades.

No foolproof method has yet been found to treat water satisfactorily once and for all. There is always a continuing need for vigilant supervision of operating conditions, supplemented by the routine addition of various inhibitors.

The latest trend is to operate the water-treatment plant automatically, by remote control. Recorders in the central control room indicate such water properties as turbidity, pH value (for acidity), conductivity, silica and total solids content, pressure, and temperature. The purity of the steam is also recorded, by analyzing for sodium. Minor changes in the treatment process can be accomplished from this control room.

Manufacturers indicate that such automatically controlled systems are now available with accuracies of from 0.01 to 0.05 ppm.

In addition, inhibitors, such as chromates or polyphosphates, are added to the treated water, to maintain a chemical balance inside the system between water, steam, and metals, and to prevent foaming, microbiological growths, and corrosion.

**The steam turbine can offer definite cost advantages as a prime mover wherever the low-pressure steam from the turbine exhaust can be used in a refinery process.**

Yet few refiners (only 4%) pointed to steam turbines as a trend toward greater economy.

Manufacturers, on the other hand, predict a wider acceptance of steam turbines in the near future, because:

- Turbine speeds up to 10,000 rpm. can be selected to match the speed of equipment, without the need of a stepup gear (such as is needed with electric motors for high speed).
- Their wide, adjustable speed range is an advantage to obtain process flexibility.
- Governing can be provided, to respond automatically to process variables.

PACKAGED BOILER, by Combustion Engineering, Inc., is hauled to a refinery completely mounted, with burners and forced-air fan, ready to be connected to fuel tank and stack.

- Steam turbines are acceptable to areas where an explosive atmosphere exists.

Actually, when its exhaust steam can be utilized, either for a process or as a steam supply for another turbine drive, the noncondensing steam turbine has the lowest heat requirement of any driver.

**Several manufacturers predict, and 7% of the refiners agree, that the use of the gas turbine to drive large**

**continued ▸**

# Take lubricants, for example

## There's a USS steel container to meet almost every shipping need

Petroleum is like many other products, spending some part of its life in a steel shipping container. A wide variety of products arrive at their destinations stable, safe, sanitary, in carbon or stainless-steel shipping containers that are manufactured by United States Steel.

USS steel drums and pails come in a variety of sizes and closures, offering flexibility in choosing a shipping container, whatever you may manufacture. They represent the largest, most complete line available today, for the shipment of products as varied as paint and petroleum, chemicals and food, additives and essences.

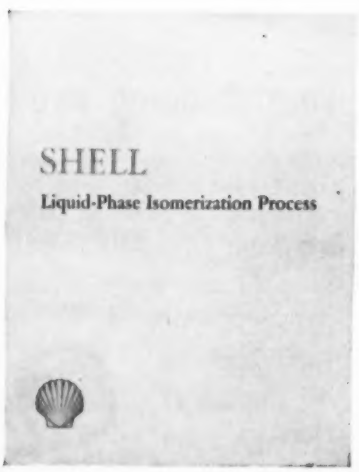
• • •

Factories: Los Angeles and Alameda, Calif. • Port Arthur, Texas Chicago, Ill. • New Orleans, La. • Sharon, Pa. • Camden, N. J.

**United States Steel Products**
**Division of**
**United States Steel**

USS TRADEMARK

# Shell's unique LPI* Process isomerizes both $C_4$ and $C_5$ at industry's lowest cost

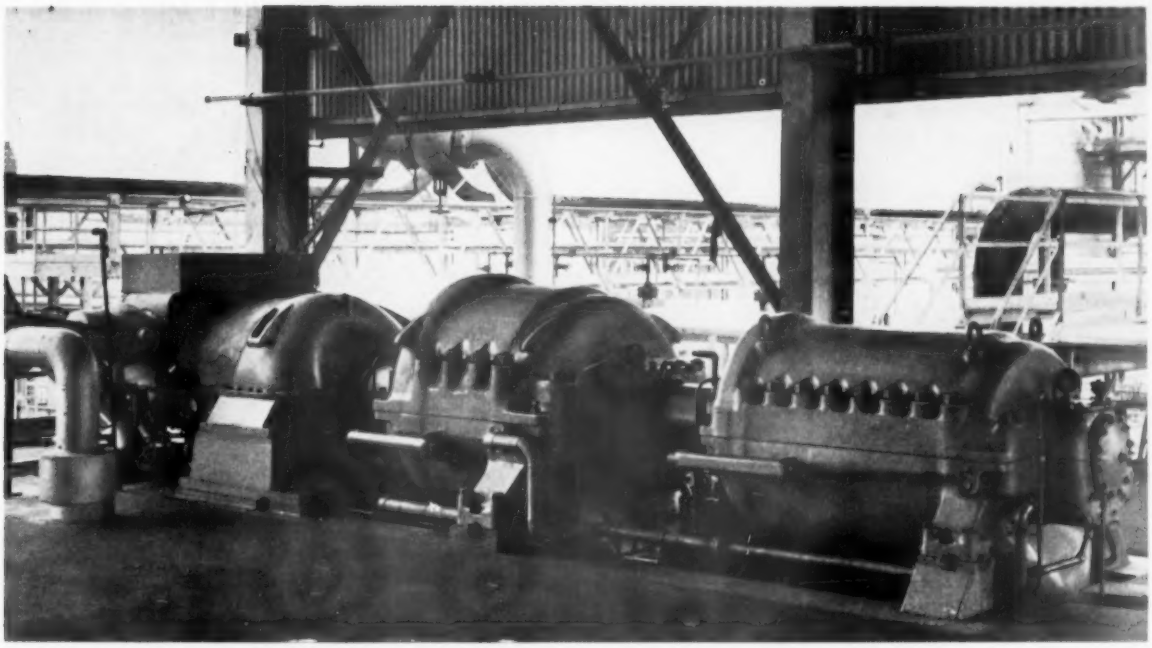



Shell's *Liquid-Phase Isomerization Process is completely described in this new book. Send now for your free copy to Shell Development Company, 50 West 50th Street, New York 20, New York.

SHELL

LPI process licensed only by

**SHELL DEVELOPMENT COMPANY**



**TWO CENTRIFUGAL COMPRESSORS, multistage, horizontally-split, are driven by a steam turbine in a refinery. Clark Bros., the manufacturer, says efficiency is particularly good because low-pressure steam can be used in a process unit.**

**pieces of high-speed equipment will spread among refiners,** due mostly to:

- Possible use of inexpensive gas available in refineries.
- No need for cooling water, in most designs.
- Great flexibility of operation, with speeds from 1,500 to 6,000 rpm.
- Good efficiency—despite the usually low efficiency of gas turbines—when installed in conjunction with equipment capable of using the turbine exhaust gas.

**Several developments now in progress may lead to a wide, economical application of gas turbines** (diagrams, page 77).

One example is illustrated in a cycle applied by Combustion Engineering, Inc., to a large refinery of the Gulf Coast. It consists of two Westinghouse 5,300-hp. gas turbines used to drive two centrifugal compressors supplying the air for the regeneration of cat-cracking catalyst. The flue gas from this regenerator, laden with carbon monoxide and very hot, is used as fuel in two large waste-heat boilers. The exhaust gas from the turbine, containing over 17% of oxygen, at a temperature of 890F, is used partly to preheat the boiler feedwater, and partly to supply hot air to the tangential burners of the waste-heat boilers.

Another development by Elliott Co., is at present being used in a refinery in Canada. It makes direct use of the flue gases from the catalyst regenerator to drive a gas turbine. Since the gases are laden with as much as 1,300 ppm. of catalyst dust, which would erode the inside of a gas turbine within a few hours, they first go through a specially constructed dust separator. The gas turbine drives a compressor which, in turn, supplies air to the regenerator. The only fuel entering the cycle is the carbon burned during the catalyst regeneration process. Such a system, according to Elliott, costs less to install than a steam-turbine-driven compressor.

**Trends in refinery fuels follow closely local economic conditions. Fuels that do not have a ready market are burned within the refinery.**

In this country, refinery gas is used as first choice in all refinery furnaces. After that, the heaviest residual fuels, asphalts in some cases, are burned, after being adequately preheated.

When available, petroleum coke is used as next choice.

**In Europe, the situation is substantially different at present from that in the U.S. The product that can be burned most economically in refineries, in many European countries, is straight-run gasoline.**

This is due to the great demand for distillates as diesel fuel, heating oil, and jet fuel, the increasing value of gas as a petrochemical raw material, and the high consumption of residual oils as industrial fuels.

Actually the pattern of fuel cost, taxation, and distribution is becoming so complex abroad that equipment is being constantly developed toward one purpose: that of being able to make use, in engines or oil burners, of what-refinery product is most economically available.

The marketing director of a leading company, with many refineries abroad, expresses the trend in these words: "We are rapidly approaching the point where we shall be selling energy, regardless of the form under which it will appear. Users will buy indifferently gasoline, distillates, gas, or heavy fuels. And there will be available equipment capable of using it. There will be small differences in price, small differences in efficiency, but the final cost to the consumer will be substantially the same."

**continued ▶**

SPECIAL REPORT $ COST REDUCTION IN **REFINING**

**LIGHT, MOBILE CRANE made by Bucyrus-Erie typifies equipment used to simplify maintenance problems in refineries today.**

## Maintenance Cost Can Be Cut

**Refinery maintenance is a fertile field for cost reduction.**

Over 50% of the refiners indicated in the survey that they were making some changes either in the organization of their maintenance program, or in the equipment used, or both.

The organization of labor and supervision for maintaining a refinery in satisfactory running condition, taking care of periodic turnarounds, and doing routine cleaning and repairs, appears to be a controversial subject at present. Since labor relations are involved, including work-rules and local-practices clauses in the working agreements with labor unions, most refiners are reluctant to discuss the matter, much less to have their opinions published.

One major company, with many refineries throughout the country, indicates that it has no companywide rules. In fact, a spokesman says, it has as many systems as it has refineries. The selection of the most satisfactory method is left to the judgment of the refinery superintendent, who "is better located than the management to keep his finger on the pulse of the labor situation in his own refinery."

Personal relationship between labor and management, rather than scientific approach, seems to be the key to the method adopted by most companies. Efficiency ranks second to smooth, trouble-free operation in most cases.

Many trends are apparent in refinery maintenance, however:

- Although refinery throughputs have increased over 50% on the average, in the past ten years, refinery manpower has decreased rather than increased in that period.
- Major process units are now designed for less frequent turnarounds. Over the past ten years the frequency of turnarounds has been cut in half, according to the engineering manager of a major company.
- Great improvements in maintenance equipment have simplified maintenance operations, cut down on the space needed around units for their maintenance, and reduced the time needed for turnarounds. The crawler-type telescopic crane is one example of such improved equipment. Use of high-pressure water, foams, and chemicals as effective cleaning media has also contributed to the savings in maintenance costs.
- On-stream inspection with improved instrumentation has made it possible to check the internal condition of equipment without having to take it off the line.
- More careful scheduling of the work, better tools, and easier availability of parts in the zones where they are needed are all factors that have improved maintenance routine.

**The use of contract maintenance appears to be gaining momentum among refiners.**

This is the practice whereby a refiner contracts with an engineering company for the full responsibility of planning, coordinating, supervising, and supplying the labor for all maintenance operations in his refinery.

Contract maintenance is said by those who use it to permit to a refiner to keep his mechanical and labor force relatively stable throughout the year. The force needed for maintenance is supplied only when needed, by the contractor, who also handles all matters of labor insurance. The force is thoroughly experienced in the sort of work required, and highly flexible.

"Contract maintenance should play an important part in all future refineries," according to Catalytic Construction Co., which has been handling many such contracts in the U.S. and Canada for several years. "It is a 'must' with the trend in the petroleum industry toward more complex and continuous processing units."

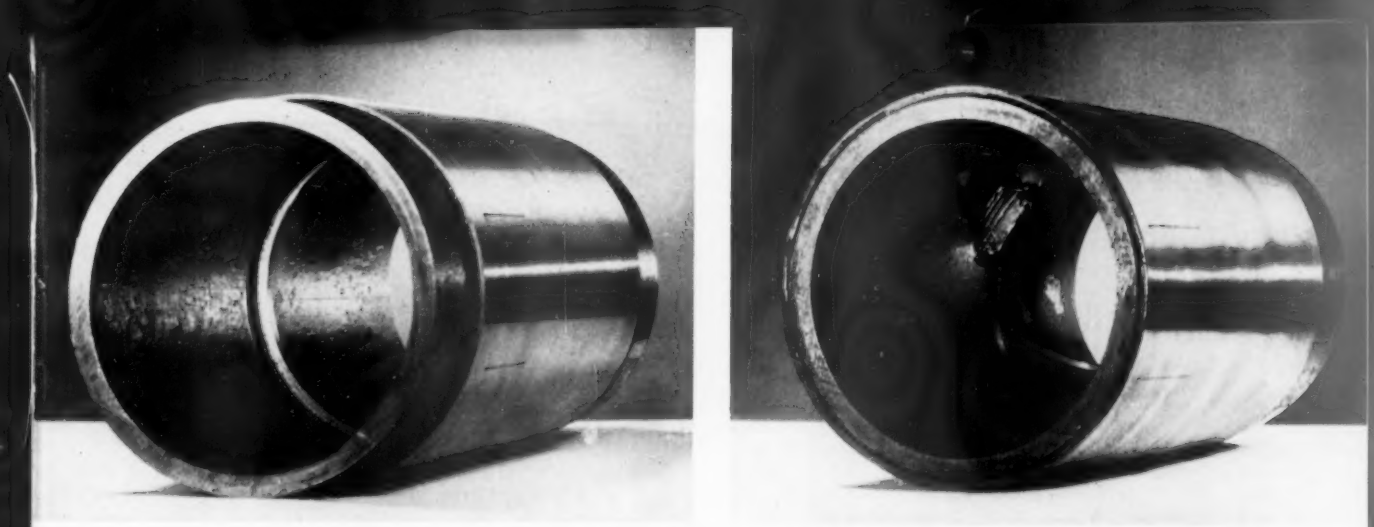
"Nearly every refinery manager is interested in contract maintenance," the company explains, "but the majority of them are shackled by their local union agreements, which prevent them from using contract maintenance freely."

Contract maintenance is used in refineries having capacities as low as 5,000 b/d and as high as 155,000 b/d. It may apply to the entire refinery, or only to portions of it, such as a single process unit.


**REPRINTS AVAILABLE**

**Reprints of this report are being prepared and will be available next month. Single copies will be sent to PETROLEUM WEEK subscribers on request without charge. Additional copies will be billed at the following rates: 1-10 copies, 50¢ each; 11-100, 40¢ each; 101-1,000, 30¢ each; over 1,000, 20¢ each. Address orders to:**

Readers Service Dept.
PETROLEUM WEEK
330 West 42nd Street, New York 36, N. Y.



A National Super Deep-Well Coupling, containing two sections of 7¾" O.D. Deep-Well Casing with Buttress-Thread. Each section projects 2" from coupling.

BEFORE

AFTER

The power hammer has driven one section of the casing into the coupling to meet with the other section. Both sections are a mass of distorted and twisted steel, yet the casing coupling did not fail.

# How tough can a casing joint get?

## USS National Buttress-Thread joint takes brutal pounding but remains intact!

Six times a 4000-pound steam hammer, under terrific velocity, slammed down onto the USS National Deep-Well Casing driving it into the Super-Deep-Well Coupling. Inside the coupling, the threads played leapfrog—the two sections of casing met in the middle of the coupling, and climbed all over each other. With each smashing blow, the coupling "bellied" out until it began to look like a buckled barrel. But it remained intact.

**How tough can deep-well drilling get?**

This test is a simulated drop test, designed to approximate, as closely as possible, severe field conditions. Although the test is more severe than any shock load a string of casing might encounter in the hole, it does prove conclusively that the Buttress-threaded and coupled joint is more than ready to withstand the tough deep-well stresses.

In addition to this drop test, many hydrostatic and galling tests have been made at the mill on the Buttress-Thread joint, with highly successful results. The high tensile strength of the patented Buttress-Thread joint is due largely to the combined effect of the completely engaged runout threads and the three-degree flank angle of the thread which supports the weight of the casing in the well. The joint is virtually as strong as the body of the pipe.

For further information on National Seamless Threaded and Coupled Casing, or these other National Seamless Oil Country Products—Deoxidized Bessemer Steel Casing and Tubing, Warm-Worked Casing, Threaded and Coupled Drill Pipe, *Deep-Well* Casing, *Super Deep-Well* Casing, and Hi-Pres-Sure External-Upset Tubing—write to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa. Export Distributors: United States Steel Export Company, New York.

*USS and National are registered trademarks*

USS National Tube Division of United States Steel

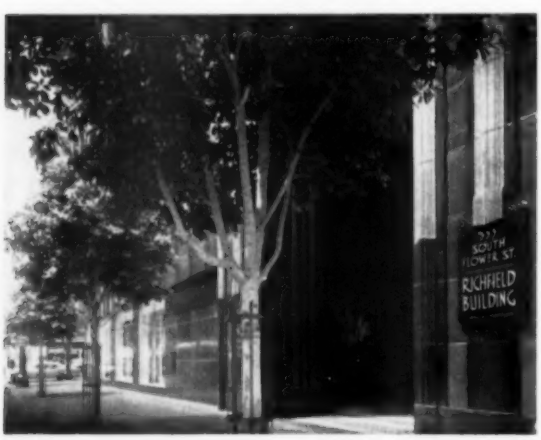
Pacific Coast Distributors: Columbia-Geneva Steel Division, San Francisco
Export Distributors: United States Steel Export Company, New York

The world's largest and most experienced manufacturer of tubular products

UNION OIL Center has a series of informal gardens around the building and in the parking area.

TIDEWATER OIL CO. building has earned a landscaping Civic Award. It features swaying palms and tropical plantings.

GENERAL PETROLEUM CORP., (Mobil Oil Co., on Jan. 1) has plantings at the entrance and in the building interior.




RICHFIELD OIL CORP., started a street tree program four years ago. The building entrance also is decorative.

*In scenic Los Angeles:*

# Industry Shows It Can Be Beautiful

**Oil firms are using swaying palms, exotic orchids, coral trees, purple jacarandas, Chinese magnolias, planters, and architectural designs to enhance the landscaping enchantment.**

First-time visitors to Los Angeles are always amazed at the colorful landscaping and the abundance of flowers.

The city's oil companies are among the pioneers in the use of floral designs and planters to make their stately buildings even more spectacular.

Richfield Oil Corp. planted Indian laurel trees around its downtown building four years ago, and has inspired the installation of more than 160 trees since then.

Superior Oil Co. set the pace for parking-lot beautification with lovely trees in the lot, and marble walls. A patio behind the building is a tropical garden.

Most spectacular of all downtown plantings is the Union Oil Center. It features a series of informal gardens, and shrubs and flowers were selected to provide color all year.

Union also bought a cluttered traffic island near its Center, landscaped it, and presented it to the City.

DU PONT *Petroleum Chemicals* NEWS

Number 99 in a Series of Bulletins for the Petroleum Industry

NOVEMBER-DECEMBER 1959

# New Du Pont Cartoon Movie Wins Friends for Refiners

**MANAGER, CLEVELAND DISTRICT OFFICE**

**JOSEPH G. EVANS** was recently appointed manager of the Cleveland district office of the Petroleum Chemicals Division.

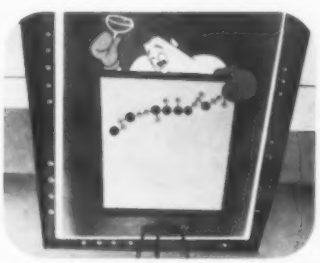
Mr. Evans, a native of Franklin, Pennsylvania, was graduated from Texas A&M College with a bachelor of science degree in mechanical engineering and joined the Petroleum Chemicals Division of the Du Pont Company in December of 1951 as a sales service representative in Tulsa, Oklahoma. He was formerly associated with the Standard Stoker Company of Erie, Pennsylvania, as a development engineer, and later formed his own company handling specialized industrial and automotive lubricants.

Mr. Evans spent five years as an officer aboard submarines and destroyers in the Pacific area during World War II.

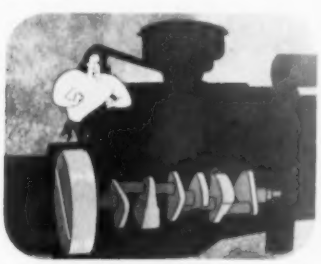
Previous to his present assignment, Mr. Evans managed the San Francisco district office of the Petroleum Chemicals Division. He has had considerable experience with refinery problems especially in connection with the handling of tetraethyl lead and other additives. He is a member of the American Society of Mechanical Engineers and the API.

Remember Aladdin's genie? He had nothing on the mighty-muscled genie who waits to serve mankind today in each gallon of gasoline. Aladdin had only to rub his lamp. Today's motorist has only to say "Fill 'er up!"

For thousands of years "Gasoline" remained hidden underground, waiting for that day in 1859 when "he" would be released. Even then the need for his strength was slow to develop. In 1898 there were only 800 cars on the road. Today there are more than 70 million cars and trucks.



To give gasoline even stronger muscles for the big jobs it must do, it is torn apart and put together again by reforming, polymerization and alkylation. And, in spite of taxes of around 9¢ on every gallon, it is still one of our biggest bargains.



Today, gasoline not only keeps car wheels turning, but also supplies the power for braking, for steering, for lighting the road, for blowing the horn, for radio music and news, for air conditioning . . . even for lighting a cigarette and activating power seats and power windows.

**"Gasoline is one of today's biggest bargains"** is the message left with the viewers of Du Pont's newest cartoon movie, "Fill 'Er Up!" Subtle, yet hard-hitting, it makes the point to your audience simply and unmistakably. It does an effective public relations job for you when shown to employees or local school, social and civic groups.

The story of oil progress and, by implication, your part in it is told entertainingly. As important as the story it tells, though, is the fact that it leaves your audiences with a warm and friendly feeling toward you as the sponsor as well as toward the whole oil industry. It leaves them with a new realization and appreciation of the important role played by the genie who comes from a gasoline pump—instead of a lamp. And it does all this in 12 minutes!

Prints for your use are available at partial print cost or on extended loan through your Du Pont Petroleum Chemicals representative, or write to E. I. du Pont de Nemours & Co. (Inc.), Petroleum Chemicals Division, Wilmington 98, Delaware.

*ADVERTISEMENT—Prepared for the Petroleum Chemicals Division of E. I. du Pont de Nemours & Company (Inc.)*

OVER

# DU PONT *Petroleum Chemicals* NEWS

## Petroleum Laboratory Facilities Expanded

Progress invariably involves change.

So you'll find some changes being made at the Du Pont Petroleum Laboratory at Deepwater, N. J. We are adding facilities so that we can keep pace with the increasing needs of the industry. Our intention is to improve the nature and scope of our service to customers.

These pictures will give you some idea of what has taken place.

Among the new facilities at our Petroleum Laboratory is this single-cylinder test engine room. You will find six engines, complete with the newest instrumentation, here.

Special projects, often undertaken in behalf of a customer, get the full attention of senior staff members who have ample room and facilities to work with their assistants in a new series of private labs recently added to the main Petroleum Laboratory.

## Building a Flare Stack? How High Is "High Enough?"

How to figure ground level concentrations of toxic gases if the flare should be extinguished, where and when they might occur under different weather conditions are included in this important paper by F. T. Bodurtha, Jr.

Mr. Bodurtha is consulting engineer with the Engineering Service Division of Du Pont's Engineering Department. He consults on air pollution problems for existing and proposed new plants.

"Flare Stacks—How Tall?" discloses the latest and most reliable methods for computing stack heights needed for adequate disposal of contaminants with or without flaring, and taking into consideration such essentials as velocity of flare gases, thermal rise, wind speed, density, and surrounding topography.

A reprint of this paper, which appeared in the December 15, 1958 issue of *Chemical Engineering*, can be obtained by writing Petroleum Chemicals Division, E. I. du Pont de Nemours & Company (Inc.), Wilmington 98, Delaware.

## New TEL Sidetrack for Philadelphia Area

The latest TEL sidetrack is on the Pennsylvania Railroad at Philadelphia. Deliveries from it will be made at any hour, day or night, to meet your emergencies or sudden needs.

Like the other 22 emergency shipping points, it will keep ample supplies of both motor and aviation mix on hand. For less-than-tank-car quantities, order from the truck terminals at Carneys Point, N. J.; Antioch and El Monte, Calif.; Beaumont, Texas; and Ferndale, Wash. For more information, contact your nearest sales office.

**SALES OFFICES**

**Chicago 3**—8 So. Michigan Ave. ..... RAndolph 6-8630
**Cleveland 15**—101 Prospect Ave. ..... MAin 1-3422
**Houston 2**—705 Bank of Commerce Bldg. ..... CApitol 5-1151
**Los Angeles 17**—612 So. Flower St. ..... MAdison 4-1354
**New York 20**—45 Rockefeller Plaza ..... COlumbus 5-2342
**Philadelphia 2**—3 Penn Center Plaza ..... LOcust 8-3531
**Pittsburgh 22**—1 Gateway Center ..... ATlantic 1-2933
**San Francisco 4**—111 Sutter St. ..... EXbrook 2-1934
**Seattle 3**—4003 Aurora Ave. ..... MElrose 2-6977
**Tulsa 1**—1811 So. Baltimore Ave. ..... LUther 5-5578
**In Canada**—Du Pont of Canada Limited, Petroleum Chemicals, 85 Eglinton Ave. East, **Toronto 12**—Ontario ..... HUdson 1-6461
**OTHER COUNTRIES:** Petroleum Chemicals Division, Export Sales, Wilmington 98, Delaware. PRospect 4-2962.

DU PONT
REG. U. S. PAT. OFF.

**Better Things for Better Living**
***... through Chemistry***

## Du Pont Tetraethyl Lead and other Petroleum Additives

OVER

*ADVERTISEMENT—Prepared for the Petroleum Chemicals Division of E. I. du Pont de Nemours & Company (Inc.)*

A-12207

Printed in U.S.A.

# Recent Explosions Teach Useful Lessons

**Startup procedures of refinery equipment should scrupulously eliminate any possibility of air being present, if hazardous conditions are to be avoided. This is particularly true for old units; present procedure on these should be reviewed in the light of recent accidents.**

This advice was given at the Division of Refining session during the annual meeting of the American Petroleum Institute in Chicago this week, by O. A. Pipkin, of Cities Service Oil Co.

Pipkin described in detail the explosion that occurred at the Cities Service Ponca City (Okla.) refinery on the morning of Jan. 22, 1959.

In that specific case, an evening-shift operator failed to open the vent valve of an old Dubbs coking unit dephlegmator, while the unit was being put back on the line after decoking.

The entire crew, Pipkin explained, failed to notice—or to interpret correctly—an excessive rise in pressure in the unit while it was being filled with oil. They also attributed the unusual slowness of the operation to the very cold weather that night, which made the oil particularly viscous.

Under ordinary circumstances, when the dephlegmator is full of oil prior to starting, the vent valve is closed, to build up the pressure to 225 psi. for a pressure and leak check. Also, when the charge stock is at normal temperature, filling can be accomplished in three to four hours.

That night, the unit just would not fill up; oil pumps ran hot; and the pressure had gone up to 300 psi. before the operators realized that the vent valve must have been left closed.

One man went to open it. That is when the explosion occurred.

There is little doubt, Pipkin said, that the explosion was caused by spontaneous ignition of ram oil vapors in the presence of air in the dephlegmator. Ram oil is a light distillate which is used in small quantities before each startup to flush out valves, drains, level lines, and pressure connections. It has a low spontaneous ignition temperature (469F to 493F).

**The hazards of air in refinery processing cannot be overemphasized. To impress this upon refinery operators, a better training technique seems to be in order.**

As a result of the explosion, Pipkin went on to say, operating procedures on other units were reviewed, and two unsafe practices were corrected. In one case, a stabilizing unit was being purged by displacing air with gas, rather than first purging it with steam, then with gas. The other case involved a thermal cracker startup procedure, where air was being displaced with hot vapors.

**Concurrently, oil must be kept out of high-pressure air systems, as well as out of oxygen lines.**

At the same API session, T. L. Smith, head of the supersonic wind tunnel laboratory at the Aberdeen Proving Ground, analyzed the causes of an explosion that had occurred on Feb. 10, 1959, in a pipe leading from the air-cooler to the throttling valve of the air compressor plant.

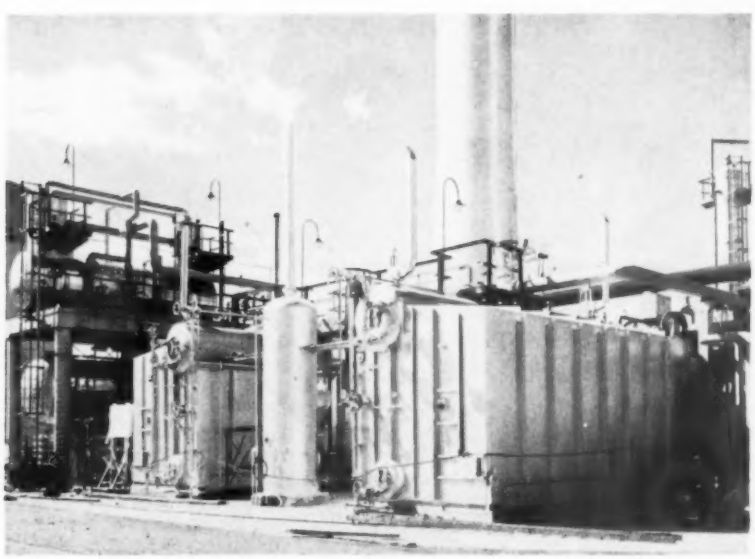
The compressor was being run at a discharge pressure of 750 psi. At that pressure, the air temperature is slightly above 500F. The oil that caused the explosion, according to Smith, has an auto-ignition temperature of about 400F at 750 psi. It was an SAE 10 turbine oil of a standard brand. Some of that oil—used in the compressor—was found in the compressor barrel drains and in the piping. It was later discovered, said Smith, that the shaft-seal control was inadequate to handle starting conditions.

To avoid a recurrence of such an accident, and still be able to test at high air speeds, the air for the hypersonic tunnel, Smith explained, will now be taken from the discharge of an old compressor plant at about 100 psi. and passed through an electrostatic precipitator to remove any oil droplets. Then it will be compressed up to 2,250 psi. in new centrifugal compressors.

**With more high-pressure wind tunnels being built, and with the increased use of oxygen in steel production and in the chemical industry, designs will have to be altered to avoid any chance of oil getting into high-pressure air lines.**

At Aberdeen, these precautions are now being taken:

- All oil-contaminated lines are washed with solvents.
- The shaft seal of air compressors is being redesigned—preferably to a multistage air labyrinth, with the air bled between stages being returned to the suction of another compressor to prevent its loss.
- An automatic detection sys-

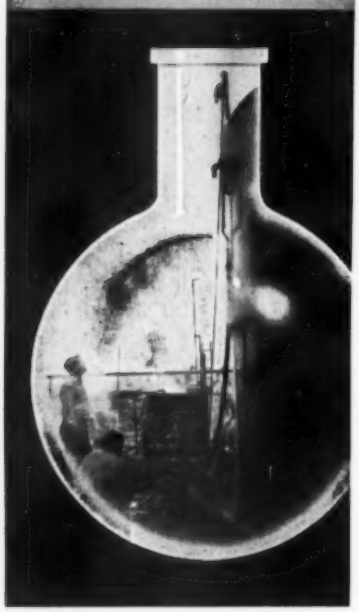


## Out-of-Doors Boilers in Fashion

**Two packaged boiler units supply steam for heat and processes at the Trafalgar refinery Cities Service Refining (Canada) Ltd. The two-drum, D-shaped boilers, designed and installed by Foster Wheeler, Ltd., produce 50,000 lb. of steam each at 300 psi. Gas or a wide variety of liquid fuels can be used.**

A-12207 Printed in U.S.A.

Oakite ECP...



Best way to strip a tank exterior

STUDIES indicate that the best way to clean off all old paint from storage tanks is the Oakite ECP way . . . which recommends the *Hot Flow-On* method. At one refinery, jobs which took costly man-days of tedious wire brushing were completed in just a few hours by a two-man crew.

Oakite's ENGINEERED CLEANING PROGRAM stresses chemical cleaning. It's engineered specifically for your refinery, for your cleaning problems, and for each cleaning operation —tower by tower, valve by valve.

The Oakite engineer provides fully qualified technical service. He supplies detailed instruction based on practical refinery experience.

Each Oakite ECP is backed by a *laboratory* concentrating on chemical cleaning research, by *materials* known to make short work of refinery soils, by proved *methods*. Send for Bulletins. Oakite Products, Inc., 44C Rector Street, New York 6, N. Y.

OAKITE. ECP your economy key

*In our 50th year.*

tem for oil droplets or vapors is being installed.

• Drain points in piping are regularly checked for traces of oil.

The day after the Aberdeen explosion, on Feb. 11, 1959, a serious explosion occurred on a compressor testing unit at Ingersoll Rand Co's plant at Phillipsburg, N.J.

Darwin W. Schmitt, engineer in charge of the turbo-blower department, described the accident at the API Refining Division meeting.

The cause was very similar to that of the Aberdeen explosion: traces of oil in the compressed air passages.

There are two facts, in establishing safety measures against ignition of air-oil mixtures, which are not well known, Schmitt said:

• The conditions under which auto-ignition of combustible components of a mixture may occur in air.

• Whether or not the temperature of compressor discharge is a true measure of the highest temperature at any point within the compressor passages.

The committee that investigated the Phillipsburg explosion made several recommendations:

(1) Test circuits should eliminate at least one of the three elements of the combustion triangle—oxygen, a combustible, and heat.

(2) In high-speed-compressor testing circuits, the operator must realize that he cannot assume without careful verification that he has eliminated all sources of high temperature or ignition.

(3) Whether oil seals or labyrinth seals are used, oil leakage cannot be entirely avoided. Thus, a safe gas, such as nitrogen, carbon dioxide, argon, or helium, should be used in the tests, to exclude oxygen.

(4) Use of recording instruments is recommended, and safety sensing devices should be installed at strategic locations to stop the compressor in the event of malfunction.

(5) More knowledge is desirable about the behavior of oils used to lubricate and seal compressors.

**Recent explosions confirm the belief that almost all flammable gaseous hydrocarbon-air mixtures can detonate. Flammable hydrocarbon mists in air will also detonate.**

"Until recently," R. B. Jacobs, manager of engineering research of Standard Oil Co. (Ind.), told the API meeting, "it was generally thought that gaseous detonations were largely confined to rapid-burning mixtures, which would include the following: hydrogen with oxygen or air, unsaturated hydrocarbons with oxygen or air, or saturated hydrocarbons with oxygen.

"These beliefs had to be modified in the light of recent disasters."

It seems, Jacobs continued, that large modern installations with long pipe runs, large vessels, and high-velocity vapor lines are more susceptible to detonative explosions than were older, smaller installations, although old process units and small equipment can also be subject to detonation. Disasters can be avoided only by carefully avoiding flammable mixtures within operating units.

# Part-Throttle Knock Is Curable

**Part-throttle knocking in late model automobiles can be reduced by using a gasoline with a higher motor-method octane rating.**

H. A. Toulmin and D. L. Lenane, of Ethyl Corp., outlined remedies for part-throttle knocking at the recent meeting of the Society of Automotive Engineers, in Chicago.

One remedy, they said, would be to reduce the vacuum spark advance of the engines in the critical knocking range. But the loss in fuel mileage during part-throttle driving would be excessive, especially in city traffic, where part-throttle use is frequent.

On the other hand, for every increase in the octane rating of the fuel, as determined by the motor method, there is an identical increase in part-throttle road rating, according to the Ethyl engineers. At high speeds, however, road ratings are boosted two octane numbers for each one-number increase in motor-method octane rating.

An increase in the research-method octane number of a gasoline, they added, appears to have had little or no effect on part-throttle knocking at low speeds.

The types of hydrocarbons in the fuel have no effect on part-throttle knocking at low speeds, Toulmin and Lenane reported. But at high speeds, road performance can be improved by an increase in the aromatic content and a lowering of the olefin content (PW—Oct.16'59,p47).

At the same SAE meeting, a group of investigators who had worked on the part-throttle road-rating project of the Coordinating Research Council, Inc., reported on the results of their work. Their conclusions checked with those of the Ethyl engineers.

Photographed at Gulf Refinery, Philadelphia, Pa.

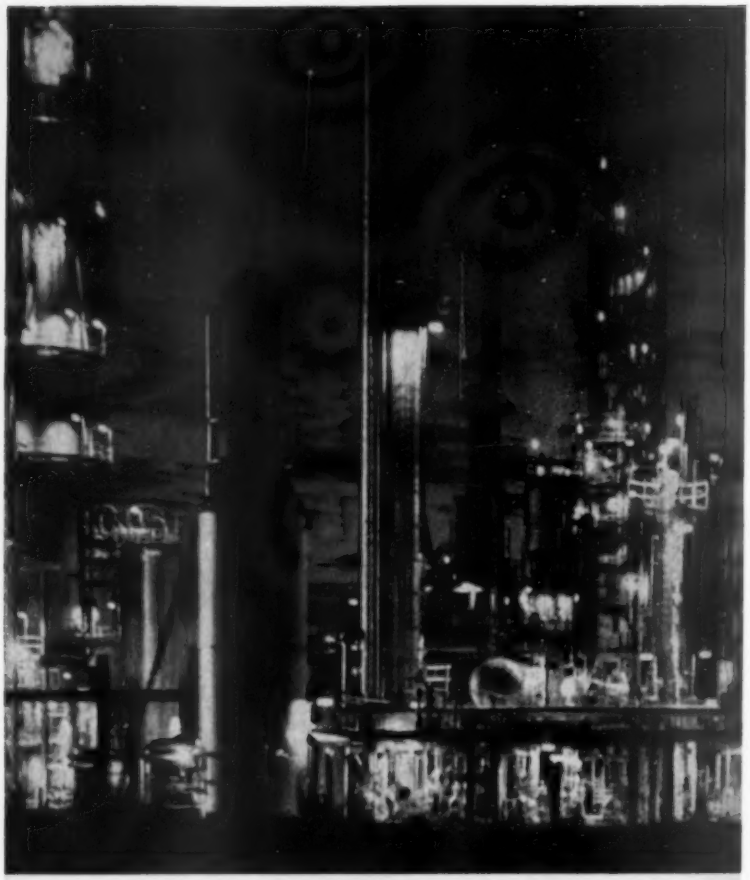
## THE GOLDEN RULE THAT PRODUCES RESULTS...

Our golden rule is teamwork between refiners and Cyanamid. As a result of this teamwork, Cyanamid produced the first fully regenerative platinum reforming catalyst and helped develop the first micro-spheroidal synthetic fluid cracking catalyst. Continued co-operation between refiners and Cyanamid is sure to produce further advances in catalytic refining techniques.

Symbolizing this co-operation is Cyanamid's salesman–the man with the golden rule. You can depend on him at all times for help in meeting the operating problems caused by demands for ever-improved fuels. His personal knowledge is backed by the research and production facilities of one of the world's leading producers of catalysts. Call him anytime he can be of help to you . . .

**Basic in catalyst chemistry** CYANAMID

AMERICAN CYANAMID COMPANY • REFINERY CHEMICALS DEPARTMENT • 30 Rockefeller Plaza, N.Y. 20, N.Y.



Nightview of UOP Fluid Catalytic Cracking (left) and "HF" Alkylation units at Leonard's Alma (Mich.) refinery.

# UOP Fluid Cat Cracker boosts production of gasoline and quality distillates

Platforming and Udex units produce high quality aromatics for Michigan's petrochemical industries.

# Leonard upgrades blending stocks with new UOP Fluid Catalytic Cracking and "HF" Alkylation units


**by Reid Brazell**
President
Leonard Refineries, Inc.
Alma, Michigan


The question has been asked of me frequently: What has motivated Leonard's growth as one of Michigan's most successful petroleum operations? It has resulted, mainly, from the challenge of the times. Each phase of our development has been chronologically prologued by conditions which have made advancement imperative.

Reid Brazell

### Early Improvement Increases Gasoline Yield 130%

Back in the mid-thirties, our chief problem as a newly formed company was to improve octane rating and consumer acceptance of Michigan refined gasoline, known then as the "bargain" gasoline. Low in price, it was also low in grade. Our first step was the installation of a then brand-new refining development, the UOP two-coil selective Thermal Cracking Unit—which enabled us to produce a more competive product and increase our gasoline yield from low-grade crude by 130%!

### First "midget" UOP Polymerization unit provided 100-plus octane blending stock

The quality picture further improved immediately thereafter with the addition of one of the world's first "midget" Catalytic

Polymerization units. It went on stream at our Alma refinery and provided 40 BPSD of 100-plus octane blending stock and permitted Leonard to market an 80-octane gasoline.

### Post-War Opportunities Foster New Facilities

The end of the war triggered another surge of growth by Leonard. First, a small catalytic cracking unit added another 3,000 BPSD of quality product to our output and this unit was later revamped to up capacity to 7,000 BPSD. An LPG plant was completed, a vacuum unit went on stream, treatment plants were completed and 648,000 barrels of tankage was erected.

Expansion took another giant step in 1955 with Leonard's acquisition of Mid-West Refineries and Roosevelt Oil & Refining Corp. A 1,200 BPSD UOP Udex® unit, tied into Roosevelt's catalytic reformer, increased Leonard's petrochemical business, enabling us to produce quality benzene and toluene for sale as chemical intermediates and solvents.

### Fluid Catalytic Cracking, and "HF" Alkylation Units Added

Another "changing condition" took place in 1958 when construction of natural gas pipelines into Michigan cut into the demand for residual fuel oils. With our gasoline and domestic heating oil sales up, but industrial fuel oil sales down, we added a 7,500 BPSD UOP Fluid Catalytic Cracking unit to reduce residual stock and produce more gasoline and quality distillates.

Simultaneously, a 1,100 BPSD "HF" Alkylation unit, designed and licensed by Universal, went on stream at our Alma refinery. Producing a 105-octane blending component, the unit made possible a super-premium fuel of more than 100-octane.

Today, Leonard's refineries total nearly 30,000 barrels per day of crude capacity. With a broad range of facilities encompassing UOP Catalytic Cracking, Vacuum Distillation, UOP Platforming®, Thermal Cracking, Udex extraction, "HF" Alkylation, Platreating* and Catalytic Polymerization, we stand ever watchful of "The Conditions of the Times" as a stimulus for future growth.

*Trademark

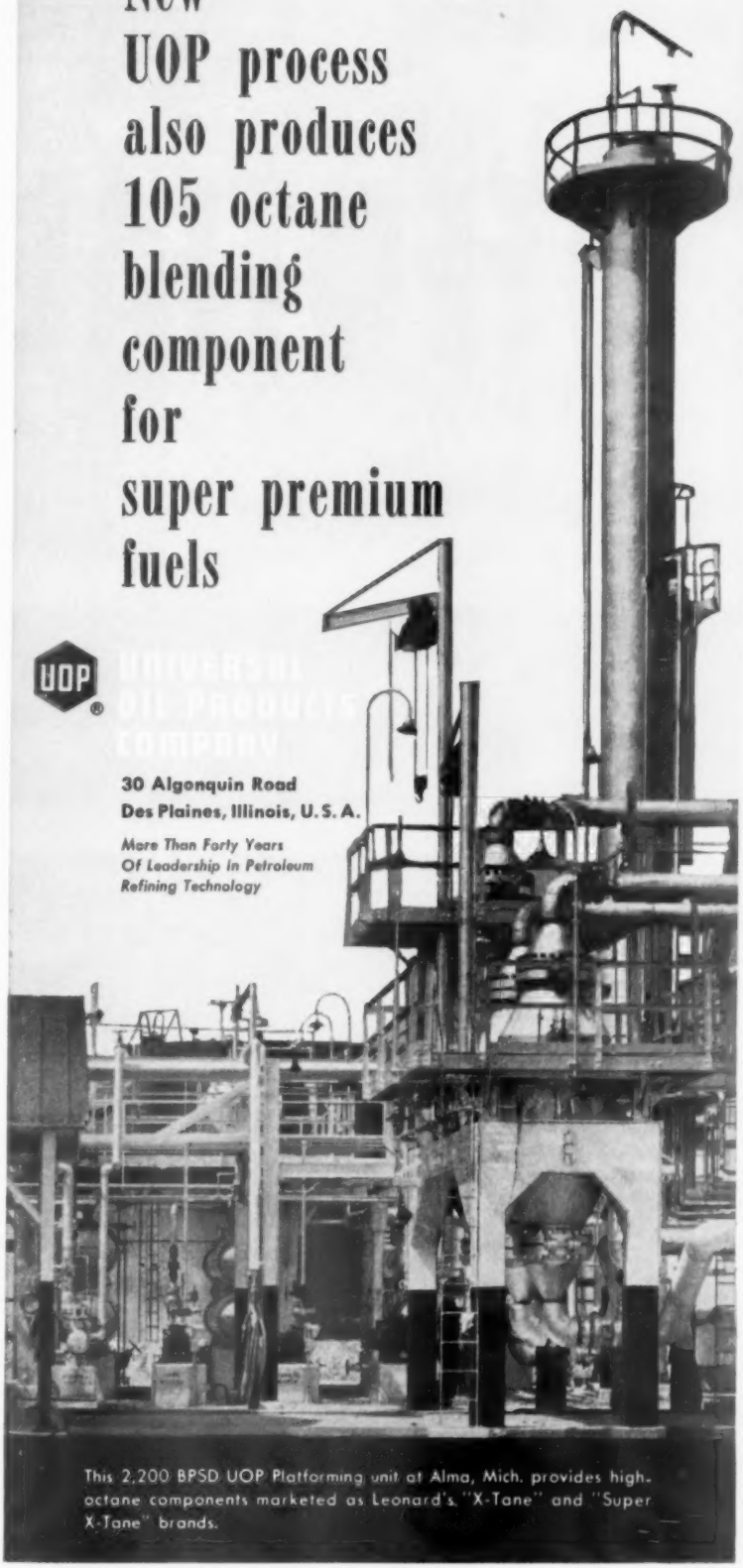

New UOP process also produces 105 octane blending component for super premium fuels

UOP®

UNIVERSAL OIL PRODUCTS COMPANY

30 Algonquin Road
Des Plaines, Illinois, U.S.A.

*More Than Forty Years Of Leadership in Petroleum Refining Technology*



This 2,200 BPSD UOP Platforming unit at Alma, Mich. provides high-octane components marketed as Leonard's "X-Tane" and "Super X-Tane" brands.

1. FABRICATION of all types of equipment (Fractionating Columns, Gas Columns, Pressure Vessels, Plate and Heavy Steel Work, Special Machines, Autoclaves, Shells, Bridge Girders) is performed to order, to specification.

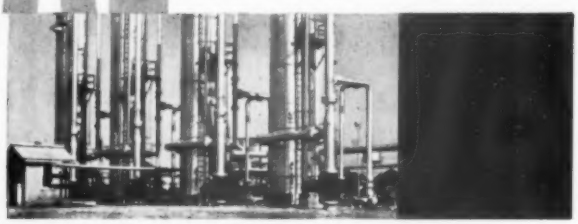
2. MACHINING—Fully equipped, flexible facilities for machining to close tolerances, regardless of product size or design.

3. STAINLESS—Separate, integrated shop for stainless fabrication protects against contamination by ordinary steel.

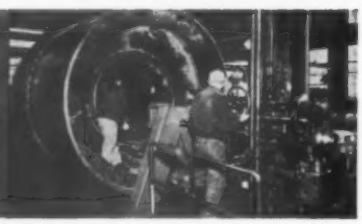
4. DELIVERY by rail, truck or inland, coastal or overseas waterway.

# POTENTIAL

1 FABRICATION



2 MACHINING



3 STAINLESS

4 DELIVERY

Through integrated, efficient operation, Sun Ship can reduce costs, increase your POTENTIAL. Call for an estimator or representative.

**Sun**

SHIPBUILDING & DRY DOCK COMPANY

ON THE DELAWARE • SINCE 1916 • CHESTER, PA.

# Alcohols Catalyzed from Ethylene

**High-molecular-weight alcohols will soon be manufactured by Continental Oil Co. by a unique process, based on the chain-growth of ethylene in the presence of an organometallic catalyst.**

Conoco is now building a plant at Lake Charles, La., to make these industrial alcohols.

High-molecular-weight, straight-chain alcohols are called "fatty alcohols," because they were originally derived from natural animal or vegetable fats and oils, such as palm oil, coconut oil, or tallow. These natural alcohols always contain an even number of carbon atoms, and have straight-chain molecules.

Shortly after World War II, high-molecular-weight alcohols were for the first time manufactured synthetically, from petroleum-derived raw materials. The Oxo process, for example, makes these higher alcohols catalytically, with olefins as starting material (PW —May22'59,p28). These alcohols differ from the natural alcohols in that they include in their formulas uneven numbers of carbon atoms, and have side-branches attached to the main hydrocarbon chain.

**Conoco's primary alcohols, called Alfols, are straight-chain products, with an even number of carbon atoms.**

To obtain any particular alcohol, the operating conditions, such as pressure, temperature, and time of reaction, are adjusted to predetermined levels.

At these levels, the process will yield a mixture of alcohols. The one desired will predominate, but the product will also include alcohols of greater and lesser molecular weight. For example, if lauric acid ($C_{12}$) is the desired product, small quantities of alcohols with $C_8$, $C_{10}$, $C_{14}$, and $C_{16}$ alcohols, and others, will also be present in the product. They must be separated by elaborate separation operations.

**One unusual part of the Alfol manufacture is that the aluminum-base catalyst is prepared as a part of the process.**

The main raw material entering the process is ethylene. It comes from the Lake Charles plant of Petroleum Chemicals, Inc., the petrochemical joint affiliate of Conoco and Cities Service Refining Corp.

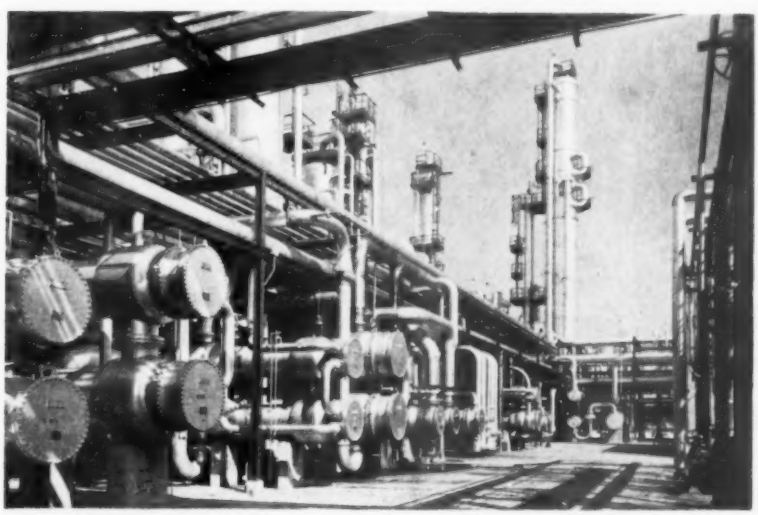
The other two materials necessary to make the Alfols are hydrogen—which comes from catreforming operations at Conoco's adjacent refinery —and metallic aluminum.

These three products—ethylene, hydrogen, and aluminum—are reacted together, and form an aluminum triethyl; this is actually the catalyst.

More ethylene is added, and the complex aluminum-hydrocarbon molecule grows in length and in weight.

Then oxygen, from a stream of air, comes into play, and oxidizes the complex into aluminum alkoxides. These alkoxides are subsequently hydrolyzed. Primary, straight-chain, high-molecular-weight alcohols are the main result, and aluminum salts the byproducts, of this hydrolysis.

**The high-molecular-weight alcohols**



**HIGH-PURITY ETHYLENE recovered in this section of Petroleum Chemicals, Inc., plant is catalytically transformed into high-molecular-weight straight-chain alcohols.**


*Choosing an Antioxidant?*

DALPAC® 4

SAVES

YOU

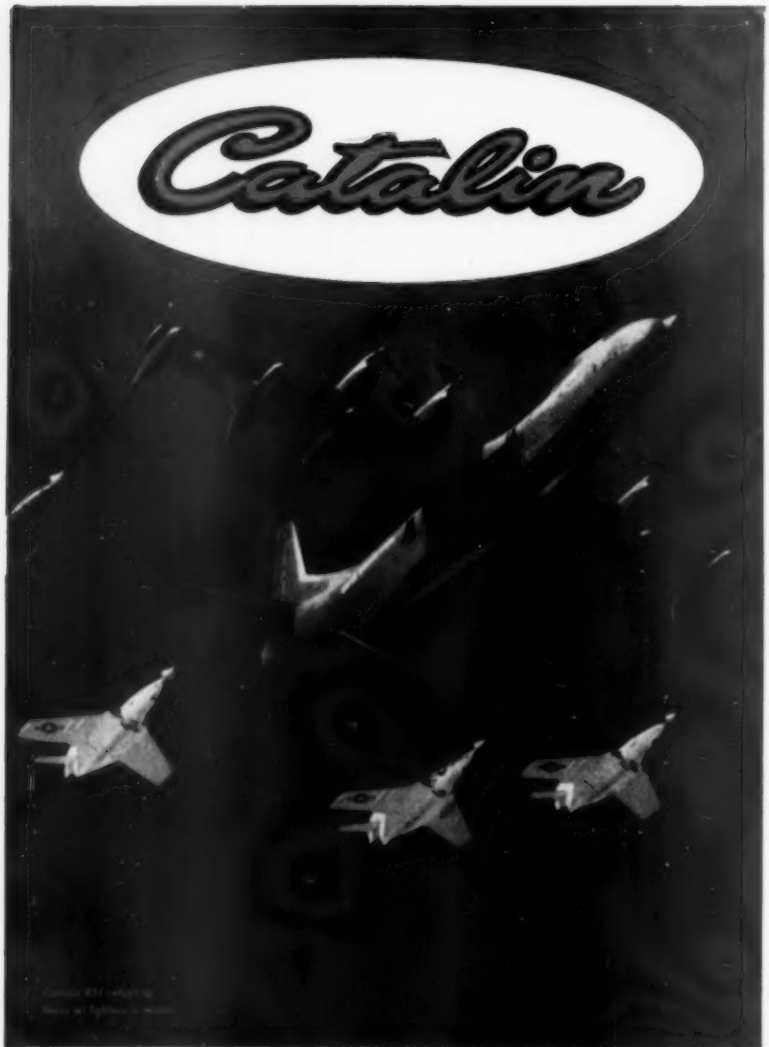
MORE

Refinery customers have found that, in comparison with other inhibitors, Dalpac 4 (Hercules 2,6-di-tert-butyl-p-cresol) saves up to three dollars on every thousand barrels of gasoline produced. Dalpac 4 inhibits gum formation, stabilizes gasoline color, and helps maintain engine cleanliness. Refiners have also found it to be excellent in turbine and transformer oils where it prevents deterioration, and does not affect electrical properties.

*For additional information write:*

*Oxychemicals Division*
*Naval Stores Department*
HERCULES POWDER COMPANY
*900 Market Street*
*Wilmington 99, Delaware*

NOS9-5R




antioxidant CAO-1

SETS THE HIGHEST STANDARDS FOR QUALITY AND PURITY

Prevents Gum and Peroxide Formation in High-Octane and Jet Fuels

Catalin ANTIOXIDANT CAO-1 . . . the field's finest grade of 2,6-ditertiary-butyl-para-cresol . . . meets U. S. Government military specifications for use in aviation gasolines, turbine and jet fuels. A major advantage achieved with this heat-resistant, water-insoluble antioxidant is that high-octane fuels are effectively protected, with no loss of octane rating. Gum and peroxide formations are inhibited, and deposits in the aircraft intake manifold and engine are markedly reduced.

Catalin ANTIOXIDANT CAO-1 stabilizes high-octane automotive gasolines, as well as turbine, insulating, hydraulic and transformer oils . . . in fact, nearly any petroleum hydrocarbon exposed to oxidizing conditions.

Samples, literature and technical assistance wait upon your request. Inquiries invited.

In addition to antioxidants, Catalin chemical products include bacteriostats, oil additives, alkylation products and special chemicals.

Catalin also produces a wide range of urea, phenolic, cresylic, resorcinol and melamine industrial resin formulations.

Catalin plastics include polystyrene, polyethylene and nylon molding and extrusion compounds.

CATALIN CORPORATION OF AMERICA • ONE PARK AVE., NEW YORK 16, N. Y.

Plants: Fords, N. J. • Calumet City, Ill. • Thomasville, N. C.

**are used in a great number of applications, particularly in the soap and detergent industry, as surface active agents, and as plasticizers.**

They can also be used in the manufacture of cosmetics, textiles, and paper, as emulsifiers. Nonionc compounds can be made from Alfol straight-chain products as easily as from branched products of the Oxo type.

The Lummus Co., which designed and built the large PCI plant for the manufacture of ammonia, high-purity ethylene, and ethylene oxide and glycol, is now building the industrial alcohols plant. It will have an initial capacity of over 50-million lb. per year. Completion is scheduled for early 1961.

## French Improve Engine-Wear Test

**A radio tracer method to determine engine wear by measuring the radioactivity of the oil-containing debris that flows down the cylinder walls has been developed** by the French Petroleum Institute, near Paris.

Radiotracer methods to determine the increase of iron debris contained in the circulating lube oil of an engine have been used in the U.S. for a long time to measure engine wear.

The French technique is said to increase the sensitivity of the measurement, to permit more accurate estimate of the start-up wear, and to take into consideration particles of metal which escape with the combustion gases, or get embedded with lacquer or varnish in the piston-ring grooves, and are never caught by the conventional methods.

**The oil moving down the cylinder liner is collected at the bottom, and pumped to a coil around a scintillator, which detects the quantity of iron contained in it.**

The oil moving up the cylinder liner, during the upstroke, is also measured, and its radioactivity is automatically deducted from the reading of radioactivity of the down-moving oil. Thus, the figure recorded at any moment is the radioactivity gained by the oil when flushing through the piston-ring area. This gain is proportional to the instantaneous wear of the engine.

This, however, is only the "apparent wear." The total wear, which also takes into account the metal—embedded or escaping—which does not circulate with the oil, can only be determined by weighing the rings be-

# Big profits wait here for the marketer offering quality lubes and fast service

A big source of profits for the independent oil marketer is the highway and building-construction market. And a big share of this lubricant business goes to the man who offers top-quality products and on-the-site service to contractors.

Sun can help you in two ways:

1. The Sun line of top-quality lubricants can assure you the respect of contractors who want top-quality products to protect their valuable earth-moving equipment.

2. You can ask Sun to help you set up your service facilities and sell your quality-and-service story to busy construction people.

**BUT REMEMBER**—the products you offer must be right. Let us show you *how* right the Sun line is for your continued success. Write for full details to General Wholesale Department PW11, Sun Oil Company, Philadelphia 3, Pa.

GENERAL WHOLESALE DEPARTMENT

**SUN OIL COMPANY**

PHILADELPHIA 3, PA.

IN CANADA: SUN OIL COMPANY LIMITED, Toronto and Montreal

# TWO NEW LOW-COST SYSTEMS IBM 1401 CARD... IBM 1401 TAPE

## with stored program speed and ability

Never before has so much powerful data processing ability been built into such low-cost systems! For in these two new IBM 1401 Systems you get features previously found only in the larger data processing systems. With 1401 Systems fewer machine units do *more* jobs . . . at *higher* speeds . . . with *greater* accuracy and reliability . . . at *lower* job cost.

To assure you of more production per data processing dollar, IBM's concept of Balanced Data Processing gives you compatible input, processing and output speeds, backed by unequalled customer service. Drawing on all the experience gained in developing the world's largest and fastest computers, these low-cost 1401 Systems bring you these large computer features:

**Solid State Design**—and transistorized throughout to give you a compact system with greater accuracy and reliability. This powerful system involves no special construction . . . no air conditioning.

**Stored Program**—gives you the fully automatic processing of electronic systems. It is the key to simplified, economical operation. Completely flexible, a stored program permits you to switch easily from one type of job to another.

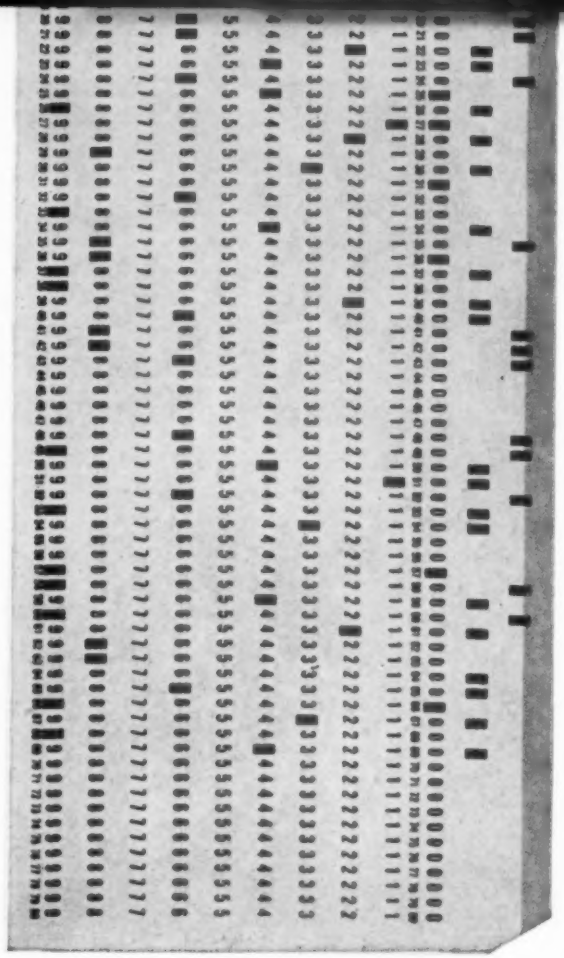
**Magnetic Core Storage**—the most powerful type storage available. To increase this power even further, the core memory of the 1401 accepts variable-length data and instructions, to permit the storage of only useful information. Choice of 1400, 2000, or 4000 positions of storage means you select the size storage to suit your needs.

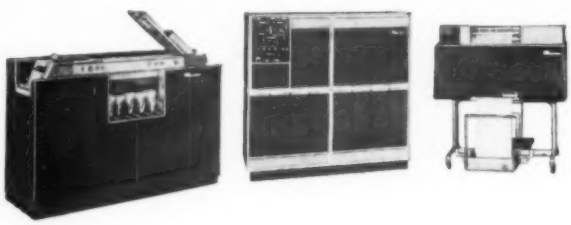
**High-Speed Printing**—these 1401 systems feature an exclusive new concept of printing. A horizontally rotating chain prints high-quality, perfectly aligned copy. A dual-speed carriage permits printing at the rate of 600 lines a minute, skipping blank paper at 27,000 lines per minute to produce more documents per dollar. Completely flexible editing and print format is provided by the central processor.

*Your local IBM representative will explain the many applications and unusual features of the new 1401 Systems. Call him today. These systems, like all IBM data processing systems, may be purchased or leased.*

**BALANCED DATA PROCESSING**

IBM.





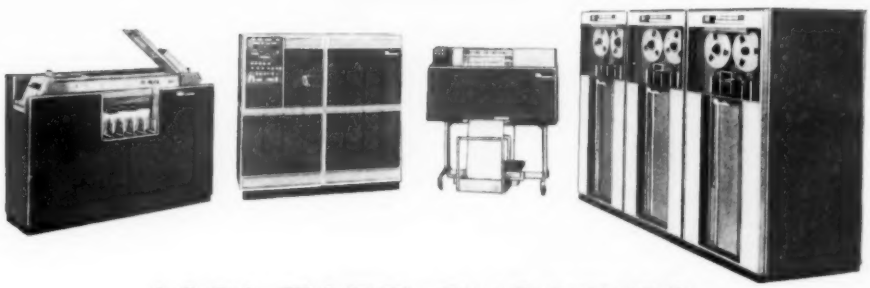
## 1401 CARD SYSTEMS

These stored program systems now bring the power of electronics to IBM card systems. They automatically handle the work of accounting machine, summary punch, and calculator, but at far greater speed, and with more flexibility and accuracy.

Input is faster—IBM cards are read into the system at the rate of 800 per minute. Data is processed automatically under stored-program control. Manual card handling is minimized.

Output is faster—documents are printed at the rate of 600 lines per minute, cards punched at 250 per minute. The system will turn out, for example, as many as 230 checks in one minute—again, more documents per dollar through Balanced Data Processing!

Thru-put is faster—data flow is automatically checked for accuracy and speeded all along the line. A unique Card Read-Punch combines card input, output, and summary punching functions. Five radial stackers accept cards that are selectively separated under stored program control.

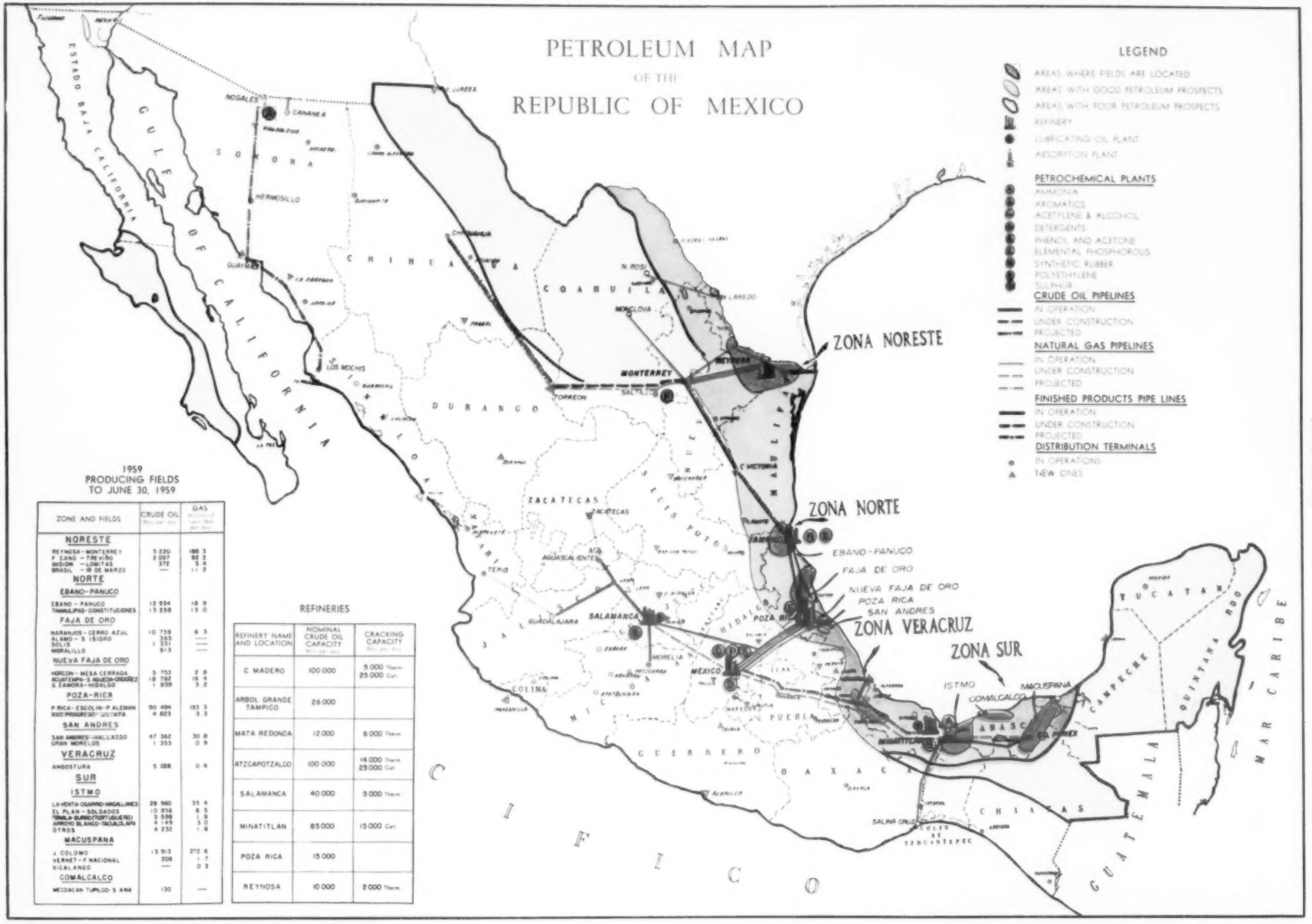


# 1401 TAPE SYSTEMS

IBM 1401 Tape Systems give you added power through use of up to six magnetic tape units. These units feed data into the system at the rate of up to 62,500 characters per second . . . record processed results at this same peak speed.

1401 Tape Systems are also extremely valuable as off-line auxiliaries to large data processing systems. They can edit tapes prepared for larger IBM systems. They make possible a tape-oriented IBM 7070 configuration that provides higher speed input and output and makes for job cost improvement.

When tape units are added to 1401 Systems, you get greater flexibility and storage advantages, too. IBM tapes provide extremely compact storage of variable-length records—the equivalent of 129,000 IBM cards on a single reel. Tape records can be of variable length, and are read into and out of the system automatically. Also, tapes can be erased and re-used to minimize your record-keeping costs.




1959
PRODUCING FIELDS
TO JUNE 30, 1959

| ZONE AND FIELDS | CRUDE OIL | GAS |
|---|---|---|
| **NORESTE** | | |
| REYNOSA - MONTERREY | 5 220 | 180 3 |
| F. CANO - TRES VIÑO | 2 097 | 82 2 |
| SIDON - LOBITAS | 372 | 5 4 |
| BRASIL - 18 DE MARZO | — | 11 2 |
| **NORTE** | | |
| **EBANO-PANUCO** | | |
| EBANO - PANUCO | 12 934 | 18 9 |
| TAMAULIPAS - CONSTITUCIONES | 13 258 | 15 0 |
| **FAJA DE ORO** | | |
| NARANJOS - CERRO AZUL | 10 738 | 6 3 |
| ALAMO - S. ISIDRO | 365 | — |
| SOLIS | 1 331 | — |
| MORALILLO | 913 | — |
| **NUEVA FAJA DE ORO** | | |
| HORCON - MESA CERRADA | 5 753 | 2 8 |
| ACUATEMPA - S. AGUEDA - CRUDEZ | 18 762 | 15 4 |
| G. ZAMORA - HIDALGO | 1 039 | 3 2 |
| **POZA-RICA** | | |
| P. RICA - ESCOLIN - P. ALEMAN | 90 496 | 193 3 |
| [illegible] | 4 823 | 3 3 |
| **SAN ANDRES** | | |
| SAN ANDRES - HALLAZGO | 47 362 | 30 8 |
| GRAN MORELOS | 1 353 | 0 9 |
| **VERACRUZ** | | |
| ANGOSTURA | 5 028 | 0 6 |
| **SUR** | | |
| **ISTMO** | | |
| LA VENTA - OGARRIO - MAGALLANES | 28 960 | 35 4 |
| EL PLAN - SOLDADOS | 10 856 | 6 5 |
| TONALA - BURRO (TORTUGUERO) | 3 598 | 1 9 |
| ARROYO BLANCO - TECOLUTLA | 4 149 | 3 0 |
| OTROS | 4 232 | 1 6 |
| **MACUSPANA** | | |
| J. COLOMO | 13 913 | 272 6 |
| VERNET - F. NACIONAL | 208 | 1 7 |
| NICOLANGO | — | 0 3 |
| **COMALCALCO** | | |
| MECOACAN TUPILCO S. ANA | 130 | — |

REFINERIES

| REFINERY NAME AND LOCATION | NOMINAL CRUDE OIL CAPACITY | CRACKING CAPACITY |
|---|---|---|
| C. MADERO | 100 000 | 5 000 Therm.<br>25 000 Cat. |
| ARBOL GRANDE TAMPICO | 26 000 | |
| MATA REDONDA | 12 000 | 6 000 Therm. |
| ATZCAPOTZALCO | 100 000 | 14 000 Therm.<br>25 000 Cat. |
| SALAMANCA | 40 000 | 3 000 Therm. |
| MINATITLAN | 85 000 | 15 000 Cat. |
| POZA RICA | 15 000 | |
| REYNOSA | 10 000 | 2 000 Therm. |

(Advertisement)

fore and after the test. The proportion of apparent wear to actual wear was found to be consistently about 82% for a straight oil and 74% for an additive oil.

**The radiotracer technique makes it possible to draw certain conclusions as to the relation between wear, engine conditions, and type of lube:**

- Oiliness agents and viscosity-index improvers are effective in reducing startup wear.
- Startup wear increases as the shut-down time increases, as the temperature of the cylinder wall increases (with low-sulfur fuels), or as the viscosity of the oil decreases.
- Any factor contributing to a better adhesion of an oil film upon the cylinder wall decreases the start-up wear.
- With a high-sulfur fuel, start-up wear increases with the sulfur content, and as the cylinder wall temperature decreases.
- Detergent-type additives appear most effective in reducing corrosive startup wear, due to their alkalinity and surface-protection capacity.

# What's New / IN PROCESSING

**Great Northern Oil Co.'s petrochemical complex at Pine Bend, Minn., continues to grow. The latest addition: a 3,800 b/d sulphuric acid alkylation plant.**

The new plant, the first of its kind in Minnesota, is set to go on stream by mid-1960. Cost is estimated at more than $1-million.

The Refinery Engineering Co., Tulsa, a division of Vitro Corp. of America, is handling the design and construction.

•

**Installation of a 25,000 b/d heavy oil cat cracker will boost production of high-octane motor fuels to 65,000 b/d at Phillips Petroleum Co.'s Borger (Tex.) refinery.**

M. W. Kellogg Co. will begin construction early next year, with completion set for 1961.

Phillips also announced plans to enlarge the plant's equipment for recovering and separating light hydrocarbons from crude distillation and cracking operations.

•

**Dow Chemical Co. will begin manufacturing polystyrene in Greece in 1961.** The Greek government has approved Dow's $1-million investment to build polystyrene facilities. Exact location of the plant has not yet been determined.

•

**Construction of a cooperative gas liquids extraction plant in Gray County, Tex., will get under way next month.** Amarillo Oil Co., a subsidiary of Pioneer Natural Gas Co. will be operator. The plant, which is designed to serve major gas producers in the area, will have a capacity of 45-million cf/d, and will extract 52,000 gal. of butane and propane daily.

The contractor, Dresser Engineering Co., of Tulsa, has set Apr. 1 as the completion date.

•

**Reserve Oil & Gas Co. last week completed its $250,000 natural gasoline plant in North Tejon field, Kern County, Calif.** It will be operated jointly by Reserve and Standard Oil Co. of California.

The plant is a dry-dessicant absorption unit, designed to process up to 35-million cf/d of natural gasoline. When compressors are installed, liquids output will reach 6,000 gal. a day.

Parkersburg Rig & Reel Co. did the design and engineering.

•

**Cyclohexanone—an organic chemical compound additive—will now be required in a major portion of Grade 1100 lubricating oil supplied to the Air Force,** the Military Petroleum Supply Agency announced last week.

Service-testing at Air Force bases has shown that the maintenance time required for reciprocating engines in T-29, C-124, and KC-97 model aircraft was cut considerably by adding 2% cyclohexanone to the regular-grade lube.

Other aircraft models, not subject to strenuous missions involving long and continuous operation, may continue to use the regular-grade oil without the additive, the Air Force says.

At present, the Navy has no plans to use the additive.


*Who needs super*

**FUEL**

*today?*

Has the fuel-buying public turned up its noses at high octane? Not on your life. And more than 15 million high compression engines built in the last three years say they won't.

That's why refiners who are using the simple, flexible HOUDRIFORMING and ISO-PLUS HOUDRIFORMING processes can look forward to profitable high octane gasoline production for a long time to come.

Maximum yield of high octane fuels or aromatics and maximum economy of operation are the profit-making combination these processes provide. And with either process, the superior activity and stability of Houdry reforming catalyst also means lowest catalyst cost per barrel of throughput.

The reason for this profit-power in Houdry processes and catalysts is people. When you work with Houdry, you're getting the services of pioneers in catalytic processes. It's the close, careful, shirtsleeve-kind of service only possible when people all but eat, sleep and live catalysis. And the advantages are all yours.

*

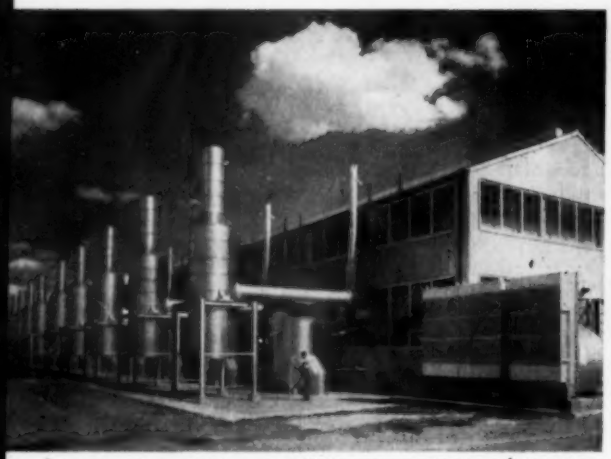
**HOUDRY**

**CATALYSTS**

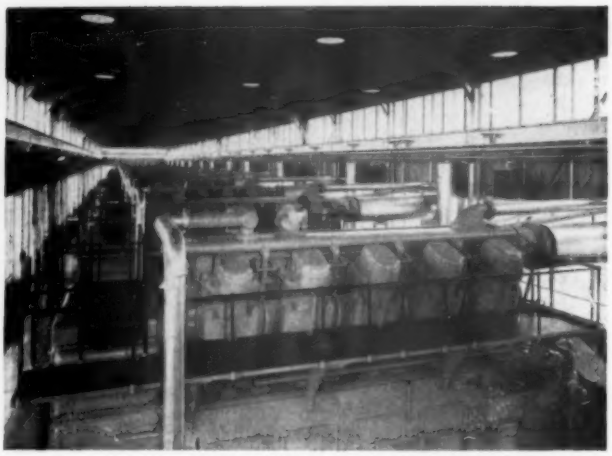
*Houdry means Progress . . . through Catalysis

HOUDRY PROCESS CORPORATION

1528 Walnut Street, Philadelphia 2, Pa.



Exterior view of Edgar G. Hill Compressor Station of Michigan Wisconsin Pipe Line Company, a subsidiary of American Natural Gas Company. It is located near Guymon, Oklahoma.



General interior view of the station with the fifteen 2400 hp Cooper-Bessemer Compressors.

Harry A. Crouch, *Superintendent, Edgar G. Hill Compressor Station of Michigan Wisconsin Pipe Line Company, points out an engine feature to* Frank Tuttle, *Division Supervisor (right), and* James Davis, *Engineer (left), and explains...*

# How our 15 Cooper-Bessemer Compressors have set a 10 year performance record

"On November 1, 1949, we put our first five Cooper-Bessemer Compressors on the line. Ten more were added during the next year. All 15 of these 2400 hp Cooper-Bessemer units . . . one of the world's biggest compressor horsepower installations under one roof . . . have operated 'round the clock, without interruption, averaging 72,000 to 78,000 total hours. Monthly operating and maintenance costs are averaging only $2.03 per installed horsepower.

"The fact that our Cooper-Bessemer engines have run the equivalent of 2200 times around the globe in an auto at 50 mph—a distance of over 50 million miles—points up the rugged dependability and superior design of these units. Their excellent performance record has fully justified our most confident expectations," says Mr. Crouch.

We will gladly help you assure this kind of performance for *your* compressor operations. Call our nearest office when you start planning new or expanded facilities.

BRANCH OFFICES: Grove City • New York • Washington Gloucester • Pittsburgh • Chicago • Minneapolis • St. Louis Kansas City • Tulsa • New Orleans • Shreveport • Houston Greggton • Dallas • Odessa • Pampa • Casper • Seattle San Francisco • Los Angeles

SUBSIDIARIES: Cooper-Bessemer of Canada, Ltd. . . . Edmonton Calgary • Toronto • Halifax

C-B Southern, Inc. . . . Houston

Cooper-Bessemer International Corporation . . . New York • Caracas Mexico City

Cooper-Bessemer, S.A. . . . Chur, Switzerland • The Hague, Netherlands

Cooper Bessemer

GENERAL OFFICES: MOUNT VERNON, OHIO

ENGINES: GAS - DIESEL - GAS-DIESEL
COMPRESSORS: RECIPROCATING AND CENTRIFUGAL
ENGINE, TURBINE OR MOTOR DRIVEN

# Inter-refinery Line Boosts Efficiency

**The newly completed interplant pipeline of Kerr-McGee Oil Industries, Inc., which links its three Oklahoma refineries, is paying dividends in greater refining and marketing flexibility—and higher profits.**

The 179-mi. pipeline has been put together over the past 13 years from seven separate segments. Four of them were bought from other companies, and three were built by Kermac itself.

With the recent completion of construction of a final 22-mi. link by Kermac, the line now extends from Wynnewood, in southern Oklahoma, to Cleveland, in the northern part of the state.

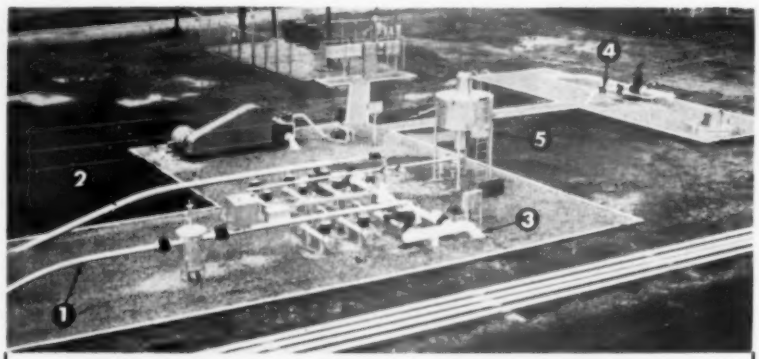
The refineries connected by the line are located at Wynnewood, Cushing, and Cleveland, Okla. They are also tied into a products storage terminal at Seminole (map).

**Construction of a single line interconnecting the three refineries was spurred by the Octane race that started shortly after World War II.**

As the quality of gasoline began to improve following the war, Kermac, like many other independent refiners, faced a choice: either keep its refineries and expand and improve its operations to boost the octane rating of its gasoline, or step out of gasoline refining altogether.

It chose the former course.

**To stay in the race, Kermac acquired the refineries at Cleveland and Cushing, and made substantial additions to the former plant and to its existing Wynnewood refinery.**




**1. Incoming crude line. 2. Outgoing crude line to refinery storage. 3. Incoming products suction header. 4. Outgoing products line to Cushing. 5. Proving assembly for both crude and products.**

MANIFOLD STATION at Kermac's Wynnewood (Okla.) refinery prevents mixing during interchanges of crude and products as they are sent through same metering bank.

In 1954, Kermac spent $2.5-million at Wynnewood for a cat cracker.

The following year, Kermac bought the Cushing plant from General American Oil Co. of Texas, along with other former Deep Rock Oil Corp. facilities, which General American had purchased a year earlier.

This purchase gave it another cat cracker. All charge stocks that are sent to its Cleveland plant for further processing are made at the Cushing refinery.

The Cleveland plant, bought from Gasteria, Inc., of Chicago, in early 1956, gave Kermac its first Platformer. In addition, it spent about $1-million to streamline that plant for production of quality naphtha and aromatic solvents.

Last year, it spent an additional $4-million at Wynnewood for a second Platformer, a treater, and a distillate Unifiner.

**To operate its refineries at separate locations at peak efficiency, however, Kermac had to connect them with one pipeline, for flexibility.** Here's how the plants were linked:

The purchase of the Gasteria refiner in 1956 included a 6-in. gathering line to Yale, Okla. Kermac built 10 mi. of line from there to Cushing to connect its two northernmost plants.

That same year, Kermac bought 25 mi. of 6-in. line between Cushing and Bristow from General American Pipe Line Co.

At Bristow, extension of the line stopped until last year.

Last year, Kermac first bought a 6-in. line between Drumright and Seminole from Pure Oil Co. To complete the Cushing-Seminole segment, it connected this line at Bristow to the one it had bought from General American.

Last year, Kermac also purchased a crude line, running from Seminole to Maysville, from Magnolia Pipe Line Co. The interplant link was nearly finished.

This past summer, Kermac completed it by building the final leg between Maysville and Wynnewood.

**Kermac's interplant line now enables it to move semifinished products from one plant to another for further processing.**

Straight-run gasoline is produced at Cushing for Platforming at Cleveland into high-octane pool gasoline. Naphtha stocks produced at Cushing are fractionated at Cleveland into naphthas and aromatics.

Much of Kermac's premium gasoline is presently refined at its Wynnewood plant and shipped unleaded to its Cleveland plant, where lead is added.

**The line provides connections with several common carrier pipelines, which transport Kermac's finished products to market.**

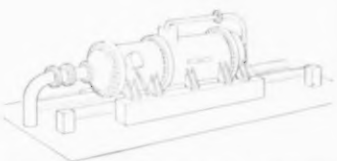
Deep Rock motor fuel, headed for branded jobbers in the Chicago area,

# More than 477,000 horsepower of

# CENTRIFUGAL COMPRESSORS

## for NATURAL GAS SERVICE

### I-R *"FIRSTS"* in Centrifugal Gas Compressor History



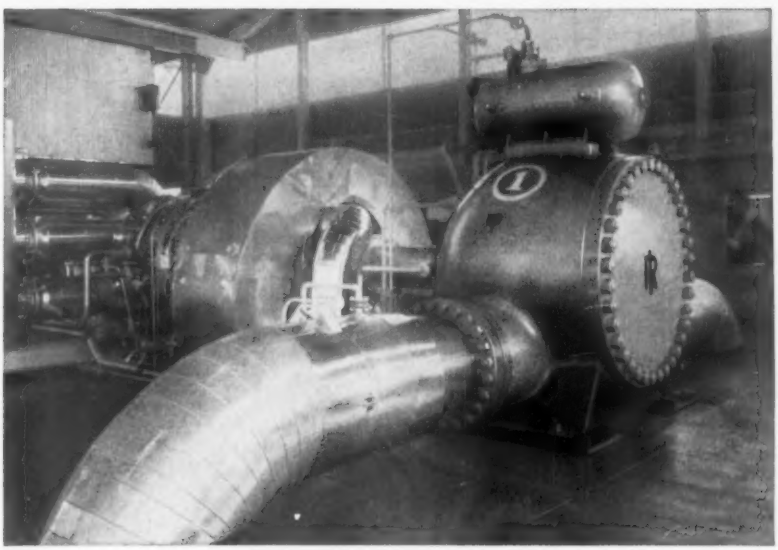
**FIRST CENTRIFUGAL PIPE-LINE COMPRESSOR** Built by Ingersoll-Rand in 1931, this centrifugal pipe-line booster consists of a six-stage compressor driven by a 3550 rpm, 3000 hp motor, all encased in a pressure vessel.

**FIRST COMMERCIAL APPLICATION** of centrifugal pipe-line compressors was made in 1947. A total of 78 electric-motor-driven, single-stage I-R centrifugals were installed, to handle approximately 250 mmcfd.

**FIRST GAS-TURBINE-DRIVEN UNIT** Installed in 1949, this Ingersoll-Rand centrifugal compressor, powered by an 1850 hp simple cycle combustion gas turbine, was the first gas-turbine-driven centrifugal compressor developed and applied to pipe-line service, and was designed for a flow of 192 mmcfd at a ratio of 1.18.



**FIRST 2000 PSI CENTRIFUGAL GAS COMPRESSOR** This Ingersoll-Rand 5000 hp double-case centrifugal compressor was the first unit ever built for handling natural gas at a discharge pressure of 2000 psi.



One of 12 Ingersoll-Rand centrifugal compressors on a large natural gas pipe-line.

## *This experience means MAXIMUM DEPENDABILITY in modern pipe-line service*

FROM the very first pipe-line installation, Ingersoll-Rand has pioneered in the development of centrifugal gas compressors for higher and higher capacities and pressures. And every step of the way, dependability of performance has been a prime consideration in every detail of design and construction. This is why more I-R Centrifugal Compressors have been sold for natural gas service than any other make . . . . a total exceeding 477,000 hp for this service alone.

Backed by such long and successful experience, the modern I-R centrifugal gas compressor is your best assurance of trouble-free performance and long-range economy in gas transmission service.

**Ingersoll-Rand**

12-736 11 Broadway, New York 4, N. Y.

COMPRESSORS • AIR TOOLS • ROCK DRILLS • TURBO-BLOWERS • CONDENSERS
CENTRIFUGAL PUMPS • DIESEL AND GAS ENGINES

is moved north through Great Lakes Pipe Line Co.'s line, which connects with Kermac's line at both Cushing and Cleveland.

The interplant line also connects with Cherokee Pipe Line Co.'s line at Cushing. Products can be shipped to the Upper Midwest via this line, or switched into Wabash Pipe Line Co.'s system at Wood River, Ill., for transport to Chicago.

Kermac's Wynnewood refinery is tied into the system of Oklahoma Mississippi River Products Line, Inc. This system has a line to McRae, Ark., and Memphis, Tenn. At McRae, products can be switched to the Little Big Inch line of Texas Eastern Transmission Co., for shipment to the Ohio Valley and the Chicago area. At Memphis, products can be transferred to barges.

**The Cleveland-Cushing section also moves crude to Cushing, where Kermac plans to install manifolds to assure positive shutoff during crude-products interchanges.**

Kermac gathers crude in the Osage field, in northeastern Oklahoma. The crude is stored at Cleveland and periodically batched to Cushing.

To keep products running north and crude moving south, as each is needed, Kermac operates that section on a two-cycle-per-month basis.

When the line is full of crude and Kermac wants to start moving naphthas to Cleveland, the product is pumped as rapidly as possible and switched in at Cushing.

After the linefill (about 5,000 bbl.) has been run, a recording gravitometer at Cleveland detects the interface, and the slop is cut to crude tanks. The slop seldom exceeds 50 bbl., says Kermac.

**Kermac has just installed manifolds, with special valves, at its Wynnewood refinery, where incoming crude and outgoing products are sent through the same metering station.** (picture, page 102).

The crude comes through a separate pipeline from fields near Wynnewood. In the past, Kermac had to interchange crude and products at the station by maintaining a pressure balance that would cut naphtha into crude when leakage occurred.

The manifolds eliminate the needs for such close attention to pressures. A "tell-tale," which bleeds leakage to the atmosphere, has been installed.

**A greater degree of seasonal inventory control than existed before is provided by the fact that the pipeline links the three refineries with Kermac's Seminole tank farm.**

Lack of storage at Wynnewood formerly meant that seasonal products not sold during peak demand periods had to be dumped on the market when prices were low.

Now these products can be stored at the 375,000-bbl. terminal.

**Kermac, which envisages further refinery expansion, says its new pipeline link will permit greater latitude in deciding where to install new equipment.**

Kermac's next stride in the octane race may be the installation of alkylation equipment.

If this is done, Kermac will have to install only one unit, at whichever plant it chooses, according to a spokesman in its refining division.

# Transport Regulation Previewed

**Rep. Oren Harris (D., Ark.) this week gave oil men a glimpse of what may lie ahead in transportation regulation and legislation.**

In his talk before the API Transportation Division, in Chicago, Harris commended the industry on its contribution of improved fuels toward the development of modern transportation methods.

"All forms of transportation—rail, pipeline, motor, water, and air," he said, "would not have developed to their present great stature without the skill of the petroleum industry in providing them with adequate fuel."

He asserted, however, that competition must be maintained among all means of transportation in the shipment of all commodities.

**Harris, chairman of the House Interstate & Foreign Commerce Commission, indicated that a decision could be expected soon on new rules for setting transportation rates for various commodities—presumably, including coal.**

Since last spring, many railroads have been charging 50¢ less per ton on shipments of 3-million tons or more. Observers feel that ICC, which has refused to suspend the lower rates, will probably authorize them on a permanent basis. The oil industry has been a bitter opponent of the reduced rates, which will expire Mar. 31 unless ICC acts favorably.

"We must continue to have a strong and healthy transportation system," he added, "but one within each mode of transportation has certain latitude and flexibility in competing for available traffic."

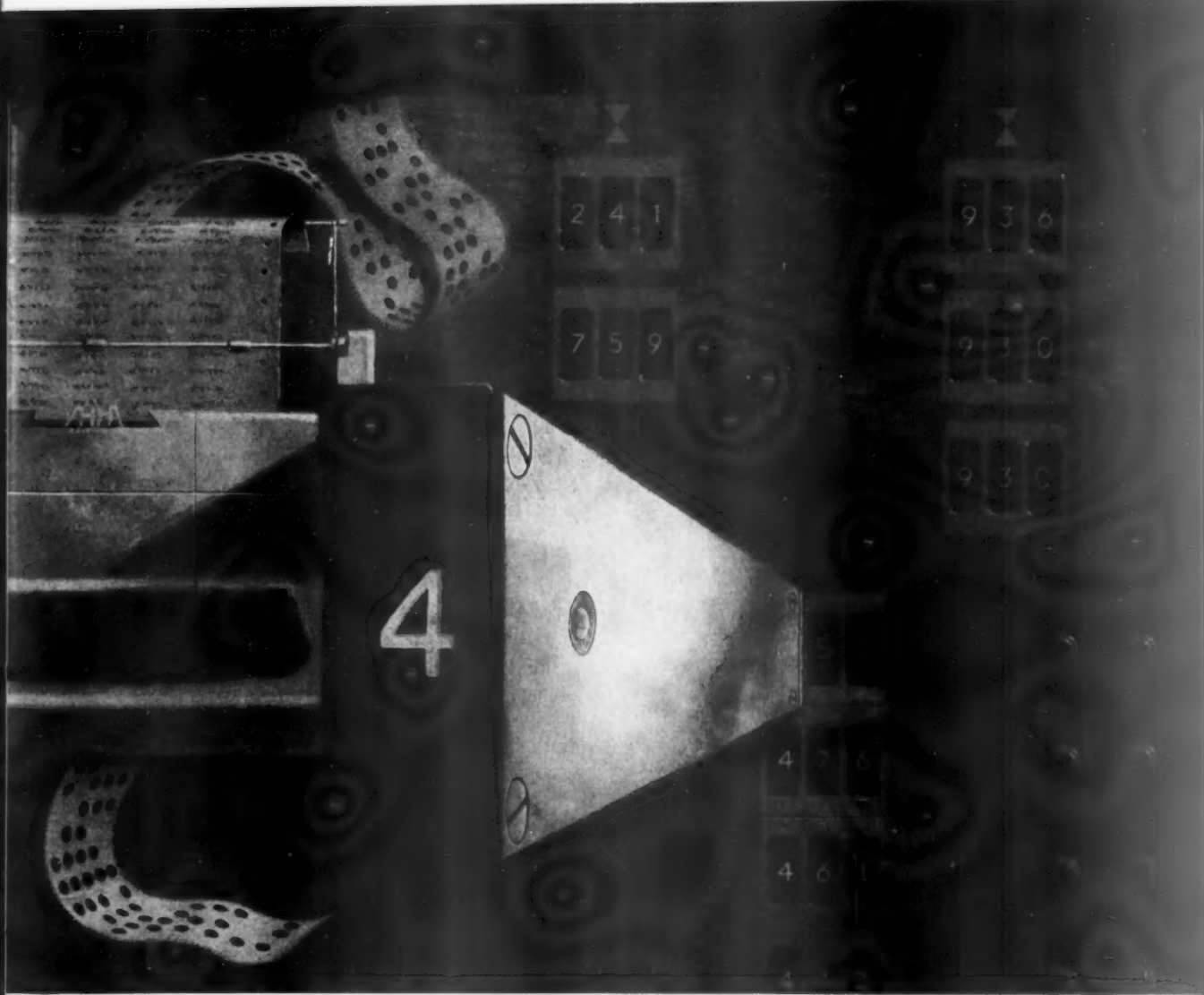
**In the regulatory field, Harris said efforts are now being made to draw the line, once and for all, between ex parte communications with commission members during hearings and "influence peddling."**

He cited no instances of the exercise of improper influence by the oil industry to gain favorable rulings.

He said that he has introduced a bill for the next Congress, which would make unlawful any ex parte communications that are made without the knowledge of the opposing parties in the case.

# Aluminum Tank Car Size Is Doubled

**The largest aluminum tank car ever built has just been delivered to Celanese Corp. of America. The 20,000-gal. car has twice the capacity of the one next to it, which was formerly the biggest aluminum tank car. The car was built by General American Transportation Corp., which has an order for 50 of them from Celanese. Advantages claimed over a steel car of the same size: the aluminum car can be used to ship chemicals and petroleum products that react chemically with steel; its lighter weight provides an additional 4,300 lb. of capacity.**



# NEW CONTROL CONCEPT
## can cut your pipeline costs

Did you ever try to solve a jigsaw puzzle without first looking at the total picture the puzzle makes? Pretty difficult—maybe even impossible. Best way, easiest way is to look at the big picture first, then see where the individual pieces fit.

It's the same with pipeline control.

First, look at your total system problem. Then, determine what sort of control system is required to safely, reliably and economically meet tomorrow's need as well as today's. That is Union Switch & Signal's approach to pipeline control.

**Any part of a pipeline system.** Union Switch & Signal can incorporate in a centralized control system any or all of the following functions: supervisory or remote control of satellite stations . . . telemetering of flow data from field back to your central dispatching office . . . automatic sequencing or control of equipment in the field . . . instrumentation . . . data handling and display . . . computing equipment . . . automatic integration of field data into your accounting operations . . . communications. Union Centralized Transport Control can be adapted to *any* problem from remote control of a single-unit booster station for gas or oil to automatic centralized control of an entire system from wellhead to ultimate consumer.

**Error-free.** Whatever the job assigned to it, Union Centralized Control operates completely free from error because it reduces to coded digital form all information and instructions transmitted to or from your central control office. As a result, you can transmit far more precise data than ever before; you can use the least expensive available communications service; and you never need to worry about lightning, noise or other interference causing a wrong or dangerous operation—this coded system automatically checks itself and responds *only* to correct and logical signals. It helps make your pipeline safer. It provides error-free *security* as well as reliability.

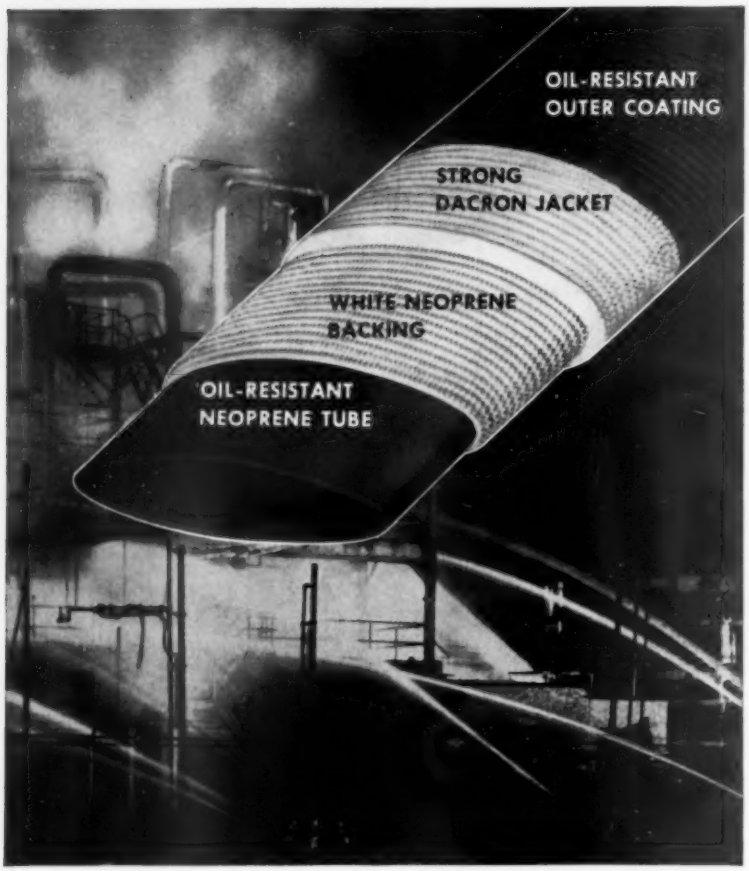
**Lower operating cost.** Most important, Union Centralized Transport Control cuts your operating costs, cuts the cost of future expansion, sometimes even cuts present installation cost of pumping stations.

*Write for Bulletins PD 2006, PD 2007 and 1052*

*"Pioneers in Push-Button Science"*

**UNION SWITCH & SIGNAL**
DIVISION OF WESTINGHOUSE AIR BRAKE COMPANY
PITTSBURGH 18, PENNSYLVANIA

# YEARS OF CHEMICAL EXPOSURE CAN'T KNOCK OUT THIS PETROCHEM FIRE HOSE




Strong, lightweight, extremely flexible, and easily folded, "Quaker" PETROCHEM is ideal for fire-protection where acids, alkalies, and hydrocarbons ruin ordinary hose.

Many large chemical plants (typical case histories on request) report PETROCHEM hose still going strong after as long as *four years'* constant exposure to sulfur, chlorine, solvents, etc., where hose previously had to be replaced two or three times a year.

Neoprene inner tube and neoprene-impregnated "Dacron" jacket give PETROCHEM maximum corrosion-resistance. *And PETROCHEM is the only all-synthetic fire hose with UL approval.*

Ask the Thermoid industrial distributor about PETROCHEM "White" and PETROCHEM "Black" fire hose to meet the severest requirements of the oil and chemical industries. Or write *Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Sts., Philadelphia 24, Pa.*

THERMOID PORTER DIVISION

H.K. PORTER COMPANY, INC.

**PORTER SERVES INDUSTRY:** with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO, S. A.; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.


# What's New
## IN PIPELINES

**The Federal Power Commission has suspended gas rate boosts by Tennessee Gas Transmission Co., and two of its customers,** pending a Dec. 15 hearing.

TGT is seeking an increase of about $26.5-million.

Customers, Tennessee Natural Gas Lines Co. and Alabama-Tennessee Natural Gas Co., want increases of $886,200 and $515,900, respectively.

•

**Shamrock Oil & Gas Corp. has set June 1 as completion date for a new 70-mi. gas line in the Texas Panhandle.**

The 16-in. line, which will have an initial capacity of 50-million cf/d, will run from Ellis Ranch field, in Ochiltree County, to Shamrock's plant in Moore County.

•

**Ohio Oil Co. has set up a wholly owned subsidiary, Marathon Pipe Line Co., to operate its pipeline system.**

Jack H. Rice, presently manager of Ohio Oil's pipeline department, will be Marathon's president.

The system comprises 3,600 mi. of pipelines in 11 states, which Ohio says, move about "20-billion barrel-miles" of crude and products a year.

•

**A 90,000-bbl. jet fuel storage terminal is being built near Helena, Mont., to serve Malmstrom and Glasgow Air Force bases.**

Completion is expected about Dec. 1. Fuel will be supplied to the terminal through a pipeline of Yellowstone Pipe Line Co.

•

## Engineering

**A new vinyl and butyl laminated pipe tape, which "gives" under impact, has been developed by West American Rubber Co., of Los Angeles.**

West American says the inner layer of butyl provides a cushion, which lessens the possibility of cuts or tears under impact.

The specially formulated butyl also permanently seals pits and prevents moisture migration at the overlap, the company says.

*New* AN AUTOMATIC, COMPACT **LimiTorque**

...FOR OPERATING YOUR

# Plug Valves

...IN 8 TO 16 SECONDS

## LimiTorque LINEAR MOTORIZED VALVE OPERATOR

**...a dependable time, labor and money saver**

Another LimiTorque *first* — here's the answer to the problem of motorizing your wrench (hand) operated Plug Valves . . . a simple, easily installed unit that can be built either to NEMA IV (weather-proof), or NEMA VII (explosion-proof) standards . . . an inexpensive, sturdy, fully reliable and extremely compact assembly that requires no gear changes or modifications, other than to supply a motor with the proper output speed. The *LimiTorque Linear Operator* consists of motor and double reduction gearing which drive a traveling screw and a crank that is easily mounted to the square shank of plug valve.

As noted in the illustrations, the entire assembly can be readily adapted to your plug valve while in service, by merely mounting the crank on the plug shank and strapping the support bracket to the pipe . . . The *Linear Operator* is supplied with all necessary adapting parts such as the support bracket and straps for mounting on the pipeline; also the necessary crank arm for mounting on the square shank of valve plug — The entire construction and operation is indeed simple . . . and the purchase price and installation costs are comparatively low.

A torque of 175# is developed at the valve, which is normally more than enough to drive most wrench-operated plug valves up to 6" in size. If power fails, or manual operation is desired, the mere removal of a pin (which connects the traveling screw to the crank arm) will divorce the crank from the *Linear Operator* assembly — and a bar placed in the bushed bore of the crank arm will operate the valve. (No special wrench is needed.) The mere flick of a switch to the direction of travel desired will operate the valve . . . Contact your valve manufacturer, or your nearest LimiTorque Sales Engineering Office.

Full details on this *new LimiTorque Linear Operator* are contained in Bulletin 20-58 . . . send for copy on your business letterhead.

THERE IS NO SUBSTITUTE FOR —

**LimiTorque®**

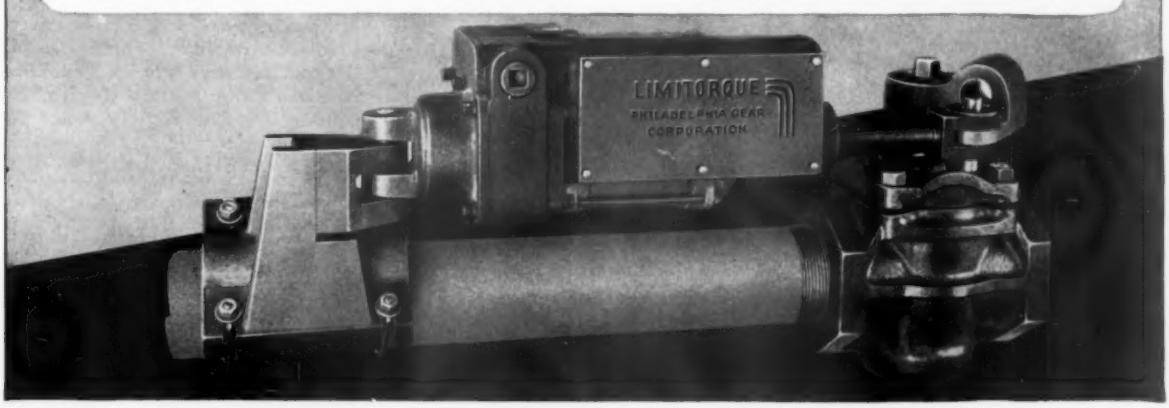
**PHILADELPHIA GEAR CORPORATION**

ERIE AVE. & G STREET, PHILADELPHIA 34, PENNA.

Offices in all Principal Cities

INDUSTRIAL GEARS & SPEED REDUCERS
LIMITORQUE VALVE CONTROLS
FLUID AGITATORS • FLEXIBLE COUPLINGS

Limitorque Corporation • Philadelphia



DEPT/International

# Arab Oil Policy Ideas Move Step Ahead

*(By cable from Petroleum Week's Middle East Bureau)*

**BEIRUT—The groundwork has been laid for renewed cooperation between Iraq and Saudi Arabia on oil questions. That's the main outcome of the Jiddah meetings ended last week** by the Arab League Oil Experts Committee (PW—Nov.6'59,p110).

Cooperation between the two Middle East states—the key oil producers in the Arab League—had been built up slowly in the early 1950s, when they were rival monarchies. It was abruptly interrupted in the confusion following the 1958 revolution in Iraq and Baghdad's political split with Cairo. Iraq, for instance, refused to attend the First Arab Oil Congress in Cairo last spring.

Saudi Arabian Oil Director Abdullah Tariki, however, has maintained all along that coordination on oil questions was not only possible but imperative if Saudi Arabia and Iraq were to get what he calls "maximum benefits" from their oil resources.

In a visit to Baghdad just before the Jiddah meetings, Tariki went to work on the Iraqis to convince them that it's oil states like Saudi Arabia and Iraq—and not Cairo—that call the tune on oil questions in the Arab league.

Iraq's reversal of its earlier intention to boycott the meetings was its first concrete indication of willingness to continue cooperation within the Arab League—if assured of the neutrality of the Cairo-based League. Iraq's Acting Director-General of Oil Affairs, Abdul Aziz Wattari, finally went to the Jiddah meetings—but alone, unassisted by aides.

Iraq has also notified the Arab League that it will participate in the forthcoming Economic Council meeting, if it is held in Beirut and not in Cairo as scheduled.

**Iraqi-Saudi cooperation may add some weight now to the oil-policy "recommendations" to be passed to the Arab League's Economic Council** for its meeting in December or January.

Without Iraq's participation, they would have been utterly meaningless. Even as it is, they do not necessarily mean any commitment on the part of either Iraq or the other oil producing governments.

They represent scarcely more than spade-work by representatives from various governmental petroleum departments.

**Most of the proposals approved at Jiddah are not "new" as such:**

- **Boycott of companies developing oil in the Algerian Sahara:** This is in support of the Algerian rebels' fight against the French government.

- **No new concessions to companies in which non-Arab governments participate.** This is a revival of a proposal that could put a ban on new oil grants to British Petroleum Co., Cie. Francaise des Petroles, and Italy's state-owned ENI in such areas as Egypt, Sudan, Morocco, Libya, or Saudi Arabia. ENI is also reported negotiating for exploration rights in Yemen, which is loosely federated with Cairo.

- **A draft agreement to standardize oil legislation, exchange statistics, and fix production quotas,** first among Arab producing states, and later with non-Arab producing countries (such as Iran and Venezuela).

- **Increased participation by Arab governments in oil operations and profits,** through national companies and other means. This could mean the "integrated" operations Tariki has been promoting, and also joint state-private operations similar to those in Egypt. Pressure is also likely from Iraq and Saudi Arabia to increase their current 50% tax on oil profits to the higher level decreed last December by Venezuela.

- **Priority to Arab companies in new concession grants.** No private Arab oil companies exist at present.

- **Arab producers to meet oil needs in nonproducing Arab states** in both war and peace.

- **Oil companies to give up concession areas that are rent-free and still undeveloped.** Iraq and the internationally owned Iraq Petroleum Co. group are negotiating on major relinquishments, on which IPC agreed in principle over a year ago. Saudi Arabia is also putting pressure on Arabian American Oil Co. to relinquish more acreage than required under its concession terms.

- **The Arab Tanker Co. proposal to be shelved**—at least for the time being.

- **An Arab Pipeline Co. to be set up—in Baghdad—as a pilot company,** with limited capital, to carry out engineering surveys on the long-range proposal to build a new Arab-owned 800,000 b/d Persian Gulf-

**AMONG THE DELEGATES AT JIDDAH meetings of the Arab League Oil Experts Committee were Lebanon's Emile Bustani; Saudi Arabia's Oil Director Abdullah Tariki, chairman; and Iraq's Director-General of Oil Affairs Abdul Aziz Wattari.**

Mediterranean network. It's a moot question what Iraq's official attitude on this Tariki-promoted plan would be, if and when the chips are down. Iraq has already approved IPC's plans for extensive additional export facilities for Iraqi oil alone—both at the Gulf and the Mediterranean. The proposed Arab line would be a competitive facility in that it would not be limited to Iraqi oil, though Iraq would stand to gain some transit income.

• **To refer to the Economic Council the proposal for an Arab Development Bank** to be financed by oil profits of both producing states and companies.

**The Jiddah meetings were the first occasion at which Arab government oil representatives officially discussed the principle of fixing production quotas.**

The principle was promoted unofficially at the Cairo Oil Congress last April by Venezuelan Oil Minister Dr. Juan Perez Alfonzo, who hopes ultimately to see a Middle East-Venezuelan agreement on coordinating production. More recently, Dr. Eduardo Acosta, Director of the Hydrocarbons Bureau in Venezuela's Ministry of Mines & Hydrocarbons, was in Jiddah on a tour of Arab capitals.

The principle had been previously endorsed by Tariki. But the whole idea of voluntarily imposing limits on production appears at odds with Iraq's present policy: Iraq is banking heavily on IPC's plans to double 1958 producing capacity by 1962, and its strained economy is already geared to the rising oil revenues it expects from increased exports.

Arab oil experts, however, minimize the contradiction between the Saudi and Iraqi policies on crude production. The reason, they say, is this: The two have far more important interests in common.

**The potential competitive threat of new oil supplies from Libya and the Algerian Sahara may have been a factor in the recommendation for a coordinated Arab oil policy.**

The plan could strengthen the bargaining position of present Arab producing states—by drawing in Libya, the Arabs hope, and also eventually Algeria.

**Many Arab political observers feel privately, however, that a joint Arab oil policy is outside the realm of reality.**

They are convinced that existing political differences among Arab countries will make any such agreement impossible.

**Persons closely associated with the Saudi petroleum department do not share this skepticism.**

Libya they say, may turn out to be "more Arab" than the world believes. The other side of that coin: Libya may not be over-eager to put any lids on intensive oil development at a time when it can foresee the beginning of oil export revenues in a couple of years.

**Eight of the ten Arab League states finally attended the Jiddah committee meetings:** the United Arab Republic (Egypt and Syria), Yemen, Lebanon, Libya, and Morocco, as well as Saudi Arabia and Iraq. Tunisia and Sudan stayed away.

The British-protected Persian Gulf oil states—which are not League members—were invited. Kuwait and Qatar attended: Bahrain did not.

# Perez 'Reassures' Independents

*(By cable from Petroleum Week's Caracas Bureau)*

**CARACAS—Oil Minister Dr. Juan Perez Alfonzo last week sought to soothe smaller companies' fears—aroused by his statements in recent Petroleum Week interviews—that the government intends to take measures against them.**

The Minister told a press conference that he had heard that some of the smaller companies interpreted his statements to mean that the government wants to suppress them.

In his Caracas interviews with PETROLEUM WEEK's Wanda Jablonski, the Minister said he would personally prefer to see only "four or five large, efficient oil companies" in Venezuela. "Numerous" foreign companies, he said, were a "waste of money to us" because of what he called "unnecessary duplication of functions."

He also stated that the independents that acquired oil concessions in 1956-57 from Dictator Perez Jimenez should have known better, and added, "I couldn't help them if I wanted to. And I don't want to."

(The interviews, which appeared in the Oct. 16 and 23 issues of PETROLEUM WEEK were approved by Perez Alfonzo as "authorized official" expressions of his views.)

**"Not everybody can be a Creole or a Shell,"** Perez Alfonzo said reassuringly last week. "If a company produces 25,000 b/d, that is important production," he added. In particular, Minister said he had been informed that Ohio Oil Co. was worried by his declarations to PETROLEUM WEEK. (Ohio Oil is one of five partners in Paria Operations, Inc. The others: Continental, Texaco, Cities Service, and Richfield.)

**Such operations as those of Paria Operations, Inc., cannot be considered "small" operations, the Minister observed.**

As an illustration, he cited the fact that the group recently brought in an offshore drilling barge—a new type for Venezuela. "We consider this operation of great interest," Perez Alfonzo said. "I am planning to take a trip to the Gulf of Paria, which I have not visited," he added.

**However, he declared, consolidation of companies is preferable for Venezuela in such cases as the proposed merger of Cia. Shell and Colon Oil Co.** (a small production affiliate of Shell's).

The economic advantages of consolidation are demonstrated, the Minister said, by the recent series of oil company mergers in the U.S.

**In reply to questions about government-company relations, Perez Alfonzo had a good word for Venezuela's biggest oil company—Creole Petroleum—and its president, Arthur Proudfit.**

Relations with Creole, a Jersey Standard affiliate, are "very good" the Minister said, "especially now that Mr. Proudfit is here." He described Proudfit as "very understanding."

The outlook for the oil industry was discussed in a closed-door conference last week between Proudfit, Venezuela's President Romulo Betancourt, the Treasury Minister, and Perez Alfonzo himself, the Oil Minister said.

Creole, because it is the biggest company, bears the "greatest responsibility" in the Venezuelan industry, he explained.

**The government, Perez Alfonzo said, is considering setting up a new agency to take charge of plans for remodeling oil towns.**

This is part of the proposed government takeover—under terms of a suggested labor contract settlement—of services that are now supplied by the companies to oilworkers (PW—Nov.6'59,p25).

The proposed agency would administer contributions from both the companies and the government, the Minister said, and would not relieve companies of economic obligations to oil workers.

# What's New / AROUND THE WORLD

**UNITED KINGDOM—Britain's lifting of import restrictions last week may increase demand for U. S. refining equipment, but it's not expected to shift the crude importing pattern.** The general reaction among refiners in Britain was that the elimination of curbs on dollar oil imports offers little inducement to shift from Middle East crude in view of the latter's cost advantage and existing contracts.

•

**VENEZUELA—Zapata Offshore Co. has spudded its first offshore wildcat for the five-company Paria Operations, Inc., from its floating vessel Nola I.** The Posa 117-1 is less than a mile south of the multiple-well platform where a second hole is now being drilled directionally from the group's sole discovery so far in the Gulf of Paria (PW—Sep.4'59,p42).

Meanwhile, the group has abandoned Posa 115 A-1, the sixth and last wildcat to be drilled from a fixed platform. It was carried to 9,000 ft. 2½ mi. southwest of the discovery.

•

**SYRIA—Cairo's General Petroleum Authority is budgeting $2.8-million for drilling four new tests in the Karatchok field in 1959-60.** The first, now nearing completion, is the eighth test in the area.

The field was discovered in northeast Syria by the J.W. Menhall-Atlantic Refining group. It was taken over last year by the government, which recently announced it will invite private capital to participate in joint development (PW—Oct.30'59, p16). The field is now said to be producing a total of 3,020 b/d from four wells.

•

**Core Laboratories, Inc., is expanding into Europe and Africa.** The Dallas-based reservoir engineering company is setting up offices in Algiers, Tripoli, and Paris to supplement long-established operations in South America and Canada.

•

**KOREA—Local interests have formed Korea Petroleum Co. to build a 20,000 b/d refinery near Ulsan.** The company apparently hopes for some government aid. Reports that U. S. oil firms marketing in Korea also would participate, could not be confirmed last week.

•

**PUERTO RICO—Gulf Oil will be the fifth major to move into island-wide marketing (PW—Sep.11'59,p48).** The company is now buying land for service stations under the name of Gulf Petroleum S.A., a Panamanian corporation. It is also reported negotiating with Caribbean Oil Refining Co. for supplies from its Catano plant near San Juan.

•

**LIBYA—A newly formed Italian company has joined the bidders for acreage in eastern Libya.** Compagnia Ricerche Idrocarburi (Cori) applied for an 11,582-sq. mi. area, which is already heavily overlapped with bids, north of British Petroleum's recently granted blocks 80 and 81 (PW—Oct. 16'59,p58). Unconfirmed reports from Milan say that Cori would be controlled by ENI, Italian government oil enterprise, which was previously refused Libyan acreage.

•

**ALGERIA—A target date of 1962 has been set for operation of the 44,000 b/d refinery to be built by a seven-company group,** in the city of Algiers. The refinery, planned to serve Algerian needs, will process Sahara crude, but it could also process sour crudes.

Participants are: Esso, 16.2%; Shell, 21%; Mobil, 6%; British Petroleum Co., 12%; Cie Francaise des Petroles, 23.8%; Cie. Francaise de Raffinage, 14%; and Beryl Algeria, 7%.

•

**JAPAN—A group of 46 Japanese consumer associations are protesting government plans to hike tariffs on crude and refined products: They propose the removal of all oil tariffs.** The associations which represent the auto, fishing, ship building, oil, iron and steel, and other industries, say that the tariffs will inevitably lead to price and wage hikes and hinder Japan's economy. (PW—Nov.6'59,p 28).

**EGYPT—Yugoslavia is set to import 40,000 tons of Egyptian crude in 1960, start of a new ten-year trade pact.** It calls for scaled annual increases in trade exchanges, which totaled $30-million in 1958.

•

**HUNGARY—The crude output goal for 1960 is expected to be surpassed by the end of this year.** Output, which was 2,300 metric tons daily last January, will reach 3,300 metric tons daily by the end of the year, Radio Budapest says.

•

## Wildcats in the News

**LIBYA**—Drilling difficulties have set back Mobil Oil's first attempt to evaluate block 13, between Esso's Zelten discovery and the Beda discovery of Amoseas, a Caltex associate. The wildcat was abandoned at 5,651 ft. Evaluation will be continued with a new hole 150 yards away.

**TURKEY**—Gulf Oil, the seventh U. S. firm to start wildcatting in Turkey, is drilling its initial test in Thrace. The No. 1 Murefte is now being drilled below 1,246 ft., 168 mi. west of Istanbul, with a National 55 rig brought in from Sicily by Pergeo, an Italian contractor.

**TURKEY**—Esso has spudded its first test on acreage adjoining Turkey's sole discovery by a foreign company. Esso spudded the No. 1 Dudere in southeastern Turkey, near the Kahta discovery of Amoseas, Caltex associate, after seven dry tests in different parts of the country.

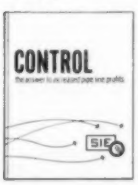
**COLOMBIA**—A third attempt is now under way to extend the Cicuco field, the only major find since 1946. Colombian Petroleum, jointly owned by Mobil Oil and Texaco, is drilling the No. 3 Boquilla, southeast of the field, below 5,000 ft. Target is the 8,100-ft. horizon that is productive at Cicuco.

**ALGERIA**—After one dry hole, Sinclair's French partner has ceased drilling operations in the Sahara, 50 mi. from the Libya border. Seismic crews will reassess the area.

# PUSH BUTTON PIPELINE

*ANOTHER first from SIE and Dresser!*

Write Rex Grey for your personal copy of . . .




"Control . . . the answer to increased pipe line profits"

SIE, through solid state electronics brings you the latest developments in remote supervision, computing and control.

- **Automatic Sequencing and Load Control**
- **Data Logging**
- **Alarm Scanning and Mimic Display**
- **Deviation and rate-of-change printout and alarm**

Designed for long life and reliability with highest data density and scan rate of any system . . . by

*Control System Specialists devoted to the oil Industry*

SIE

**SOUTHWESTERN INDUSTRIAL ELECTRONICS CO.**

A DIVISION OF DRESSER INDUSTRIES, INC.

10201 Westheimer • P. O. Box 13058 • Houston 19, Texas

**CABLE ADDRESS: SIECO HOUSTON TWX: HO 1185**

146 ACRES OF ELECTRONICS

# Business Will Be Better in the Year Ahead

Business will boom in 1960, as it recovers from the steel strike. And strong general business will help solve some current problems in the oil industry. Nothing other industries do will affect the supply of oil—or the basic problem of oversupply. But rising business activity definitely means higher petroleum demand. And this is one key to a better balance in the oil picture. A check of some key factors in the business outlook supports this optimistic forecast:

* * * *

Industrial production will rise substantially. This, of course, means bigger sales of heavy fuel oils and industrial lubricants. The early months of 1960 will be devoted to making up the drop in production caused by the steel strike. But industrial production will increase steadily through the year as businessmen and consumers step up their spending. The index of industrial production should average about 163 for 1960—up 9% from the 1959 level.

* * * *

Consumer incomes will be growing. Rising personal incomes mean more auto sales and increased spending on gasoline and oil. In the months preceding the steel strike, personal income for the nation climbed steadily; for the second quarter of this year hit a record annual rate of $381-billion—up about $15-billion from the final quarter of 1958. Most of this increase was used to buy additional consumer goods.

Similar increases are ahead in 1960. Resumption of steel production will push the personal income level to new highs. Rising output will swell income as unemployment is reduced and overtime work becomes widespread.

Sales of new cars will be up substantially next year. Total auto sales for 1960 may even top the record 7.2-million sales of 1955. Consumer spending on gasoline and oil has been rising much faster than consumer incomes in recent years, as bigger incomes permit longer and more frequent trips. Evidence points to a continuation of this trend in 1960.

* * * *

Business spending will also be increasing. Because of the prolonged steel strike, some of the capital spending slated for the final quarter of this year will be carried over into 1960.

The recently completed McGraw-Hill fall survey of business plans indicates a substantial increase in capital outlays during 1960. Total capital spending will approach the record $37-billion of 1957. Most important for the oil industry, railroads and other transport companies will be increasing their capital spending sharply over 1959 levels. Additions of diesel locomotives, aircraft, and trucks will help lift oil sales in the future.

Business will get an additional boost from inventory building in 1960. Most producers of durable goods saw their inventories of materials and finished goods reduced sharply during 1959. They'll be rebuilding their stocks to meet a growing volume of sales.

* * * *

The booming over-all business level will, however, affect some sectors of the economy adversely. Tight money—an inevitable companion of good business—has already cut the volume of residential construction. Prospective home builders find it difficult to borrow at interest rates they can pay and thus must postpone their building plans.

Road-building and other public projects are also pinched by tight money. And cutbacks in road-building and home construction lower the ceiling on potential sales of fuel oils and gasoline. So tight money can have important indirect effects on oil.

Money will become even tighter in 1960. Consumers are in a mood to buy on credit, and they'll be using much of the available loan funds. Most businessmen, however, should be able to carry out planned spending. The oil industry is still generating enough internal funds to handle its 1960 plans. In other industries, depreciation allowances and record profits being chalked up this year should provide ample funds for capital expenditures in 1960. But those who must borrow will face higher costs.

The 1960 boom thus seems certain. And it's sure to improve the outlook for oil.

# FOR FACTS ABOUT *Canada's Oil and Gas*

*A. D. Insley, Manager of the Royal Bank's Oil and Gas Department, gets close up view of drilling operation.*

The Royal Bank of Canada provides complete banking services to Oil and Gas men. Over 300 branches are strategically located throughout the Oil and Gas areas of Western Canada. Each Manager knows his own district intimately, can provide on-the-spot service,and information because he works there. The Bank's Oil and Gas Department, Calgary, issues from time to time timely "Bulletins" dealing with many aspects of the Oil and Gas business in Canada. For a list of current "Bulletins" write—The Royal Bank of Canada, Oil & Gas Department, 409 8th Avenue West, Calgary, Alta.

*We do not provide information on oil securities.*

**THE ROYAL BANK OF CANADA**

*Canada's Oil and Gas Bank*

*Over 960 branches in Canada, the Caribbean area and South America*
*Offices in New York, London, Paris*

**Assets exceed 4 billion dollars**

***Meet these men at the A.P.I. Convention:*** If you are interested, even casually, in Canada's Oil and Gas Industry, these men would like to meet you in their suite at the Congress Hotel.

A. D. INSLEY
*Manager*
Oil & Gas Dept.
Calgary

H. E. MCCLENAGHAN
*Representative*
1523 Republic Bank
Building, Dallas

J. SCHOLES
*Correspondent*
231 S. La Salle St.
Chicago

# The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

**All prices as of November 9**

Bold face type indicates changes from previous week

## KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

### Western Hemisphere

**U. S. Gulf Coast, cargoes**
- Gasoline, 98 oct prem....12.25-13
- Gasoline, 92 oct reg....11-11.5
- Kerosine....8.625-10.375
- Heating oil, No. 2....8.125-9.875
- Gas oil, 48-52 d.i....8.375-10.125
- Fuel oil, bunker "C"....$2.00-2.10

**Caribbean, cargoes**
- Avgas, Grade 100/130....15.25
- Gasoline, 93 oct research prem....11.25
- Gasoline, 87 oct research reg....10.375
- Gasoline, 79 oct research....9.625
- Gasoline, 70-72 oct motor method....9.5
- Kerosine....8.625-8.875
- Heating oil, No. 2....8.125
- Gas oil, 48-52, d.i....8.375
- Fuel oil, bunker "C"....$2.00

**New York Harbor, barges**
- Kerosine....9.35-9.6
- Heating oil, No. 2....8.85-9.1
- Fuel oil, No. 6....$2.37-2.47

**Okla-Group 3, northern shpt., bulk**
- Gasoline, 91 oct reg....10.75-11.75
- **Kerosine....9.75-10†**
- Heating oil, No. 2....8.5-8.75
- Fuel oil, No. 6....$1.40-1.80

**Chicago, bulk**
- Gasoline, 91 oct reg....11.5-11.75
- Heating oil, No. 2....9.125-10.85
- Fuel oil, No. 6 high sulfur....7.4-7.5

**Los Angeles, rack**
- Gasoline, 88 oct reg....12.15-12.65
- Diesel fuel, PS 200....8.5-11.25
- Light fuel, PS 300....$2.80
- Heavy fuel, PS 400....$2.15-2.35

**Natural Gasoline, Grade 26-70**
- FOB Group 3....4.5
- FOB Breckenridge, Tex....4

**LP-Gas**
- Propane, Oklahoma (Group 3)....5
- Propane, Baton Rouge....5.625-5.875

**Pennsylvania Lubes**
- Bright stock, 25 p.t....23
- 200 vis. neutral, 25 p.t....25

**Mid-Continent Lubes, Tulsa basis**
- Bright stock, solvent, 95 v.i....24-25
- Neutral, solvent, 200-210 vis....20.5-21.5

**Gulf Coast Lubes**
- Bright stock, solvent, 95 v.i....24
- Neutral, solvent, 200 vis....20.5

### Eastern Hemisphere

**Singapore (Pulau Bukom), cargoes**
- Avgas, grade 100/130....16.5
- Gasoline, 79 oct research....10
- Kerosine....10.125
- Gas oil, 48 d.i. minimum....9.625

## KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

### Western Hemisphere

**United States (at the well)**
- Mid-Continent, (Okla.-Kan.), 36.0-36.9....$2.62-2.97
- North Dakota, 36.0-36.9....2.62-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9....3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9....2.92-3.22
  - West Texas, sweet, 36.0-36.9....3.00
  - West Texas, N. M., inter., 36.0-36.9....2.93
  - West Texas, N. M., sour, 32.0-32.9....2.71
  - East Texas, flat....3.05-3.25
  - Mirando, 28.0-28.9....3.31
- Illinois Basin, flat....3.00
- Pennsylvania Grade, Bradford dist., flat....4.40
- California, Signal Hill, 21.0-21.9....2.22-2.32†
- North Louisiana-Arkansas, 36.0-36.9....2.77-3.02
- Wyoming, sweet, 36.0-36.9....2.85-2.90
- Wyoming, sour, 32.0-32.9....2.63-2.71

**Canada (flat prices, at the well)**
- Pembina (Alta.)....$2.38
- Leduc-Woodbend (Alta.)....2.53
- Redwater (Alta.)....2.42
- Steelman A (Sask)....2.435
- Virden (Man.)....2.31

**Venezuela (Cargoes, FOB lifting port designated)**
- Cumarebo, 47.0-47.9, Tucupido....$3.34
- San Joaquin, 41.0-41.9, Puerto la Cruz....3.10
- Oficina, 35.0-35.9, Puerto la Cruz....2.78-2.80
- Tia Juana, Medium, 26.0-26.9, Amuay....2.30
- Bachaquero, flat, Las Piedras....1.73-1.88
- Tarra, 38.0-38.9, San Lorenzo....2.83
- Lagunillas Heavy, flat, Cardon....2.10

†*Differential per deg. of grav. varies.*

### Eastern Hemisphere

**Middle East, Persian Gulf (Cargoes, FOB lifting port)**
- Arabia, 34.0-34.9, Ras Tanura....$1.90
- Safaniya, 27.0-27.9, Ras Tanura....1.50
- Iran, 34.0-34.9, Bandar Mashur....1.86
- Iran, 34.0-34.9, Abadan....1.81
- Iraq, 35.0-35.9, Fao....1.80
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.67
- Qatar, 41.0-41.9, Umm Said....2.05
- Neutral Zone, Burgham, 23.5-24.4, Mina Saud....1.51
- N. Zone, Eocene-Ratawi, 20.5-21.4, Mina Saud....1.38

**Middle East, Eastern Mediterranean**
- Arabian, 34.0-34.9, Sidon....$2.27
- Iraqi, 36.0-36.9, Tripoli, Banias....2.31

**Far East, Cargoes FOB Lutong, Sarawak**
- Seria Light, flat....$2.57

## KEY TANKER RATES

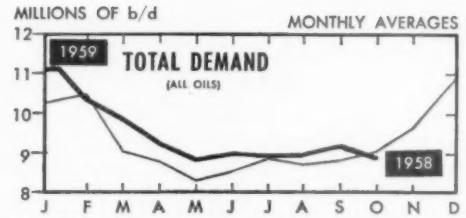
(Last paid, per long ton, single voyage)

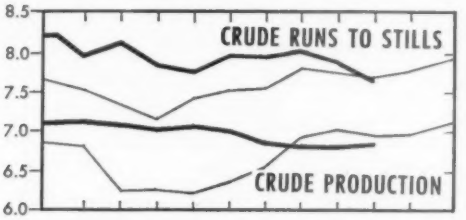
**U.S. Gulf-New York, clean....(USMC—25%) $2.14**
U.S. Gulf-New York, dirty....(USMC—30%) $2.00
**NWI-USNH, dirty....(USMC—42½%) $1.58**
**NWI-UK/Cont., dirty....(Scale—47½%) 17/1***
**Persian Gulf-UK/Cont., dirty (Scale—50%) 24/3***
Persian Gulf-USNH, dirty....(USMC—69%) $3.94

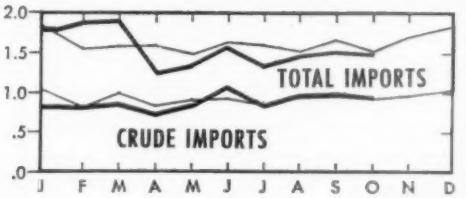
**Sterling.*

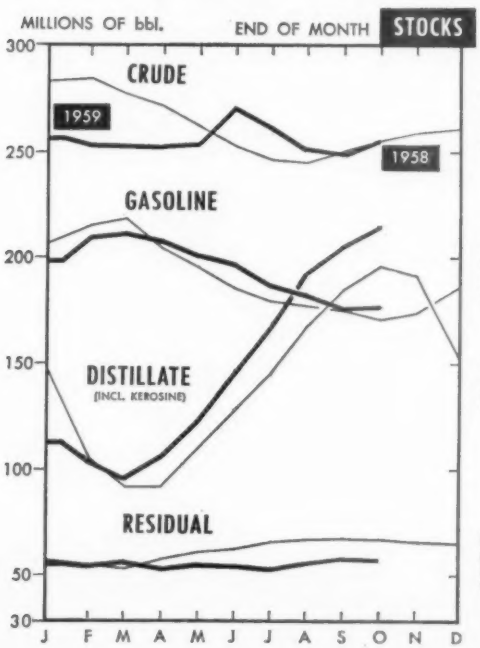
PETROLEUM WEEK'S

# Fingertip Figures






## Supply-Demand Figures for October

(millions of b/d)

| | October 1959 | % Change from year ago | 10 Months 1959 | % Change from year ago |
|---|---|---|---|---|
| Total Demand (Inc. Exports) | 8.875 | — 5.0 | 9.483 | +4.0 |
| Gasoline | 4.049 | — 1.5 | 4.153 | +4.3 |
| Distillates (Inc. Kerosine) | 1.698 | — 8.7 | 1.918 | —2.9 |
| Residual | 1.378 | —10.1 | 1.564 | +8.1 |
| Total Supply | 9.189 | — 3.6 | 9.637 | +6.3 |
| Domestic Crude | 6.851 | — 1.8 | 7.039 | +6.0 |
| Nat. Gas Liquids | .800 | ..... | .853 | +8.7 |
| Total Domestic | 7.651 | — 2.0 | 7.892 | +6.3 |
| Crude Imports | .979 | + 5.0 | .961 | +2.3 |
| Total Imports | 1.538 | —12.4 | 1.745 | +6.4 |

*Figures for period ended November 6, except as noted*

RUNS TO STILLS
Latest week *
Previous week 7.491
Year ago 7.686

CRUDE PRODUCTION
Latest week *
Previous week 6.887
Year ago 7.005

TOTAL IMPORTS
Latest week *
Previous week 1.665
Year ago 1.665

CRUDE IMPORTS
Latest week *
Previous week 1.047
Year ago .966

CRUDE STOCKS
Week ended 10-31 256.3
Previous week 253.1
Year ago 255.0

GASOLINE
Latest week *
Previous week 176.1
Year ago 169.2

DISTILLATES
Latest week *
Previous week 214.5
Year ago 197.8

RESIDUAL
Latest week *
Previous week 58.1
Year ago 68.1

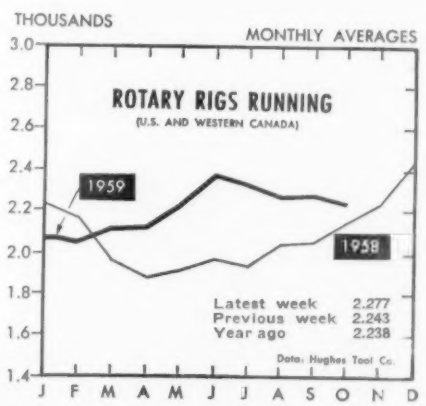
**The strong demand for gasoline and distillates in September cut deeply into the movement during October, with the result that total demand last month dropped below a year earlier.**

In the case of gasoline, the heavy September movement—averaging 4.4-million b/d—was due to the efforts of sellers and buyers alike to beat the Oct. 1 hike in federal motor fuel taxes.

In the case of distillates, buyers were taking advantage of considerable price shading—which still exists, because of oversupply. Heating oil is reported available in the Gulf Coast spot markets at discounts of from 0.25¢ to 0.5¢ a gal.

**The continued decline in industrial activity in October due to the steel strike also had an impact on demand.**

The impact was most noticeable in demand for residual fuel oil, but layoffs of employees cut into gasoline consumption, and lower shipments of goods hit demand for diesel fuel and gasoline.



# The Market Trend

## Are the Independents Making a Mistake?

**Independent refiners around the country are beginning to think like majors, and it may prove their undoing.** Gone are the days when independents worried only about getting cheap crude to make a quick, short-term profit.

**The independents nowadays are heavily invested. They want "stable" crude. They want "guaranteed" outlets for their products.** It's not enough just to sell bulk at the refinery gate. With the postwar expansion in plant capacity, there's nothing to say that a buyer will show up this week, next week—or ever.

**And so, one by one, the independents are following the majors into retail gasoline markets.** The Los Angeles independent now is an expert on Arizona. The one in New Orleans can tell you all about Nashville. The one in Corpus knows North Carolina better than Aransas Pass. The one in Oklahoma knows every new gasoline station all the way to North Texas.

**On the surface, retail markets look good, too.** Sales take place every day. Gallonage at new, expensive stations is excellent. An average 16.39¢ tank wagon price for the U.S. looks a lot better than 11¢ into tankers.

**But in renouncing the wholesale, the independents are leaving a market with built-in stabilizers.** The system of allowables for crude, the import quotas, the occasional spot buying by the majors—all, at one time or another, have helped fend off disastrous price declines.

**Entering the retail, on the other hand, the independents are tackling a market that literally has no bottom.** You don't have to think back far to recall Pueblo, Dallas, Detroit, and the Carolinas—where recent price wars have driven tank wagon down as much as 8¢ a gal.

**And retail prices at all times sit precariously over the majors' cut-rate prices to big commercial consumers.** In most areas, that's a 4¢ gap right there. All it takes is for one major to lose a big consumer account, and to funnel that volume into a private-brand string of stations. You know who will be holding the bag.

**For independent refiners, thinking like a major may prove costly.**

**Coal vs. Oil In the East:**

The coal people don't have any real screams about oil completion in the East. Recent data submitted to the Interstate Commerce Commission shows that, in 1958, steam electric plants in New England paid 40.1¢ per million Btu for coal, and 40.7¢ for oil.

The coal-oil gap is even wider at Middle Atlantic plants. The coal cost last year was 32.3¢ per million Btu; oil was 38.5¢.

**Gasoline Prices:**

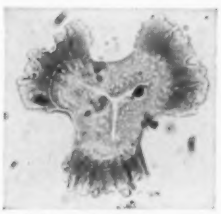
Seaboard gasoline markets continue to be the firmest in the nation. Last week, a part-cargo of regular grade was sold at the Gulf at the "full posted." On the other hand, prices slipped 0.25¢ in Oklahoma and along the Great Lakes Pipe Line.

**Hot Oil Port:**

The hottest oil port in the world right now is Rotterdam. Refinery capacity there is slated to be over 500,000 b/d by next year, with probably 60% of the products slated for export.

# Some pollen isn't to be sneezed at

## ...it may be clue to oil!



*What a 500-million-year-old spore looks like magnified.*

One of nature's most closely-guarded secrets is being unraveled today by the painstaking efforts of research scientists working with clues millions of years old, some dating back as far as 500 million years.

Scientists feel certain that vast supplies of oil lie undiscovered beneath the earth's surface. Only a few scattered and skimpy clues to its whereabouts exist. Fossils of plant and animal life are among the most important. But with the skill of an expert, nature has covered the trail well. In many areas, the better known fossils can't be found!

Constantly searching for new clues, science "detectives" in the laboratories of Pan American Petroleum Corporation, a Standard Oil affiliate, have turned to the invisible pollen and spores that fill the air to the discomfort of hay fever sufferers. (Spores are similar to pollen and also can cause hay fever symptoms.) But these pollen and spores no longer peril allergy victims, for they have been embedded in rock for millions of years.

These microscopic traces of plant life form the missing link, telling scientists the same story they normally get from the larger plant and animal fossils. Because of this new study, extensive areas, once passed over, have been opened to re-exploration. Scientists expect new oil discoveries will be made.

As the result of such trail-blazing research work America's proved underground oil reserves have grown larger, prices have remained reasonable, and America has been assured an adequate supply to keep its defenses strong.

**WHAT MAKES A COMPANY A GOOD CITIZEN?**

Responsibility for the future is inherent in good citizenship. One way a company can discharge this obligation is through research aimed at expanding America's resources and assuring future generations the benefits we enjoy today.

**This is not a florist shop.** It's a petroleum laboratory, and the plants are used to help find clues to oil deposits. Here Dr. A.T. Cross compares pollen of today's plants with fossil pollen that is more than 120 million years old.

1959

**STANDARD OIL COMPANY**
(INDIANA)

THE SIGN OF PROGRESS...
THROUGH RESEARCH

DEPT/Oil Men at Work

***Friend to 4,200 workers in Aramco's desert oil field operations . . .***

# Abqaiq's 'Mr. Safety'

Perry Norman Taylor

## "In safety work, we are dealing with people all the way—wherever we are"

**An American ex-gangpusher is proving the hard way—in the heat and sand of Saudi Arabia—how far close contact with men's work can go in building a good safety record. He is Arabian American Oil Co.'s Perry Norman Taylor,** district safety engineer for the company's drilling and production operations at Abqaiq.

These operations have one of the industry's outstanding safety records. In 1958 Abqaiq district had only 4.3 disabling accidents per million man-hours worked. The record in the first seven months of 1959 is even better —2.4. This is well under the frequency average for U.S. operations.

Taylor, who spent 18 years supervising mining and construction crews in the U.S. and Alaska, is convinced that attention to human nature and the personal problems of employees is at least as important to accident-prevention as sound safety rules.

He and his staff have their hands full, since the whole district of Abqaiq, with its 450 homes and supporting facilities, comes under the safety program as part of what Taylor calls Aramco's "mother-to-mortuary" protection of employees.

**Among the 4,200 oil field, shop, transportation, and warehouse workers in the Abqaiq district, Taylor's efforts have won him a "Mr. Safety" reputation.** Because of his prematurely white hair, he is affectionately called Shaibah (the Old One) by Arab workers.

"The Arabs have intense loyalties," says Taylor. "If you're their friend, they'll do anything you ask them."

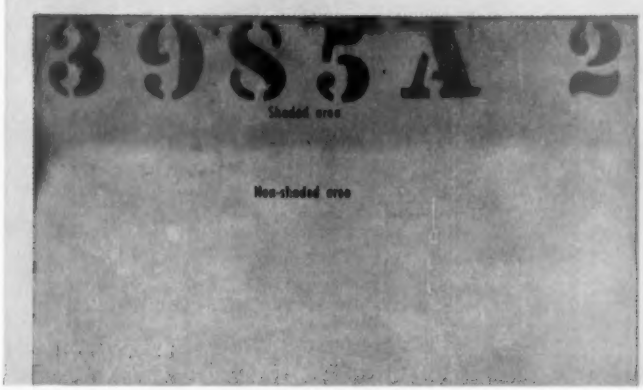
Taylor's work is made difficult by the fact that he has to deal with ten different nationalities. Included are 3,400 Saudi Arabs and sizable groups of Pakistanis, Indians, Palestinians, and Adenese. The district's crews produce close to 1-million b/d from the Ghawar and Abqaiq fields in addition to operating five land drilling rigs and one offshore in the Persian Gulf. The men have the same work classifications as production and drilling crews in the U.S. Taylor's safety responsibility extends to all shops, transportation, warehousing, and all supporting facilities of Abqaiq—from barber shops to schools.

**One of his main problems is the lack of experience of many of the workers.** Explains Taylor, "The Arabs learn fast. But they can't learn everything at once. On the other hand, their inexperience means they have no bad industrial habits."

**However, Taylor says the basic safety problems are the same as in the U.S.,** and that the Arabs' fatalistic Insh'Allah (Allah wills it) philosophy

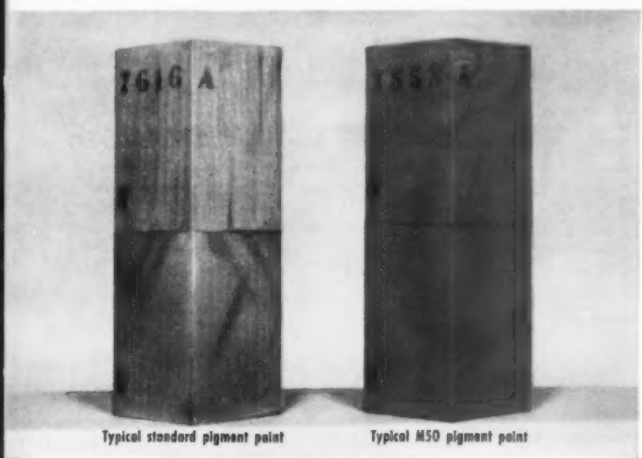
## No objectionable whitening from chalking

Contrast these two exposure test panels . . . both show comparable metal finish paints. Same original colors. Same exposure (45° South, 2 yrs., 3 mos.). Notice bright color of *M50* paint, freedom from chalk.




## No appreciable fading from light action

Now look at this 9-year exposure test panel of an *M50* paint. Contrast area shaded by wooden panel holder with non-shaded area. Clearly, there has been practically no fading in this 9-year period.



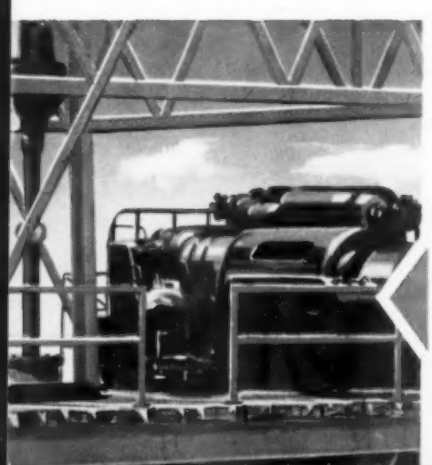

## No leaching from water action

Examine the exposure panel at left. Notice the vertical brushmarks? Rain water leaching of the top coat permits brushmarks in undercoat to show through. In the panel at right, insoluble *M50* pigment prevents this film failure. Exposure 45° South, 2 yrs., 7 mos.

## No discoloration in industrial atmosphere

Here are two exposure panels painted from the same can of *M50* paint. Both have been exposed 4 years, 45° South. The right one in normal atmosphere, the other in sulfur-laden industrial atmosphere. Notice no color difference has developed. No bilging.

# Proof you get unique color stability in metal protective paints made with M50® pigment

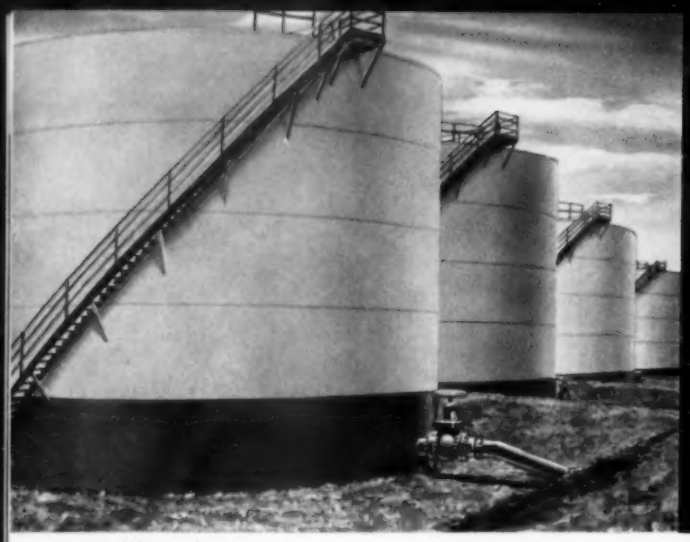


**Drilling equipment looks better, needs less maintenance painting when painted with colorful *M50* anti-corrosion paints.**

No need to amplify what the four illustrations above show. Plainly, *M50* basic lead silico chromate pigment permits your paint supplier to make paints with more color stability than ever before available in anti-corrosion paints . . . primers as well as finishes.

National Lead exposure tests demonstrate that these paints . . . both standard and heavy coat . . . also provide better and longer lasting anti-corrosion action, and never-before weather resistance. Some of the opportunities these new *M50* paints present are suggested on the following page. You'll think of others.

**M50 pigment** is a product of **National Lead Company**



**Public relations.**
Attractive tank farms that *stay* attractive longer.

**Product identification.**
Color-coded drums that *stay* colorful longer.

# Two ways to make good use of the superior color stability of M50 pigment anti-corrosion paints

Before the advent of *M50* pigment, those responsible for maintenance painting had to make a choice between colorful appearance and long-lasting corrosion protection.

With *M50* pigment paints, exposure experience proves, this compromise is no longer necessary. *M50* paints have weather resistance . . . stay bright and colorful . . . and *at the same time* provide superior corrosion protection. With these unusual paints, color stability problems . . . leaching, fading, whitening, darkening from bilging . . . are eliminated. Now, with *M50* paints, you can have maximum anti-corrosion, maximum durability and, at the same time, long-lasting good appearance.

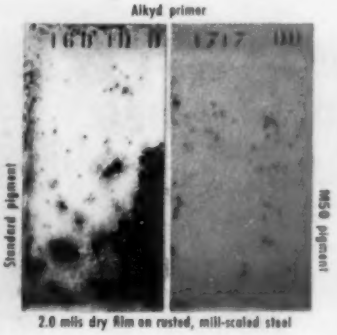
The illustrations above suggest two areas in which the combination of superior anti-corrosion action and superior color stability found in *M50* pigment paints can pay off handsomely. Note that in both, service is severe and colorful colors are needed. With *M50* paints, you repaint less often.

In your own operations there are bound to be many similar applications where specification of *M50* paints can lower your maintenance painting costs. Ask your regular paint supplier to make up suitable *M50* paints for your requirements.

## Why M50 Defense in Depth paints give anti-corrosion beyond all former concepts

2 standard pigment alkyd primer coats
1 standard pigment alkyd primer coat
Gray Alkyd Finish Coat
2 M50 pigment alkyd primer coats
1 M50 pigment alkyd primer coat

Exposed 9 years, 45°S. Each coat 1.5 mils
**Proved corrosion and weather resistance**




Exposed 45 S, 1 yr ind. atmos, 1 yr normal atmos
**Proved outstanding for film strength, durability**

Colors above available in conventional and heavy-coat paints
**A wide range of stable colors can be produced**

**Are you concerned with tank or structure maintenance painting in your firm?** If so, you are invited: (1) to visit National Lead's Sayville, L.I. test station, where you will see the results of the 20 years research that lies behind the *M50* pigment particle and the more than 10 years of exposure testing that lies behind *M50* pigment Defense in Depth paints; (2) to send coupon below for National Lead booklet, "Defense in Depth" and typical *M50* tank paint specifications.

Next time you purchase, specify *M50* pigment paints. Any paint manufacturer can supply you.

M50 Defense in Depth

**National Lead Company,**
**111 Broadway, New York 6, N. Y.**

**Gentlemen:** Please send me the "Defense in Depth" booklet together with typical tank paint formulas and color chips that I can use in specifying M50-type tank paints.

Name_____ Title_____

Firm or Dept._____

Address_____

City_____ State_____

does not make them scorn safety precautions.

"The Arabs are motivated the same as we are," Taylor observes. "They don't want to get hurt or killed."

Taylor adds, "The main point is that in safety work we are dealing with people all the way, wherever we are. I sat in an API safety meeting in Chicago last year and heard the same problems discussed that we are dealing with in Saudi Arabia."

**The Aramco safety program is based on a full range of meetings, reports, and instructional materials, all in Arabic and English.**

Taylor has a staff of 11, including safety engineers John Hoss and W. G. Parslow, three claims investigators, a claims and compensation man, two Arab safety inspectors, and clerical help. Typical of efforts to stimulate enthusiasm for safety are the cake-coffee-Pepsi-Cola parties given whenever a unit exceeds its previous run of accident-free days.

**However, Taylor feels that personal contact with workers produces the best results. He spends as much time in the field as possible.**

"The more I can talk to them out there," he says, "and the more they come into the office, the better I like it.

"We handle things on a personal basis, and we kid around. When I try to talk Arabic, the way I twist it around they laugh like the devil."

**He and his staff still haven't found a solution to some special problems, such as vehicle-speeding.** Says Taylor, "The drivers go too fast along the modern, blacktop roads around Abqaiq. And they leave broken-down vehicles in the road at night. The speeding cars plow right into these, scattering people over the countryside.

**Taylor starts his day at 6:45 a.m. with paperwork.** From 7:30 on, his time is spent in safety meetings, on the telephone, and in discussing workers' problems.

**He spends much of his spare time reading.** Sample subjects: the history of Germany from Bismarck through World War II, and the history of the Arabs. He feels that a study of Arab culture is a great help in understanding the differences between Eastern and Western thinking.

"We have to make some allowances for the emphasis on pride and face-saving in this part of the world," he says. "Take the case of one of our drivers who drove a company car into a light pole. In the accident report, he wrote it up that the light pole and its cement island moved."

**Taylor is a former Stanford football and baseball star (1930-1931), who took a major in geology to the gold and silver mines of Virginia City, Nev.** From 1937 to 1941 he worked mercury mines in Arizona, California, and Oregon, and then continued north to Alaska's Kenai Peninsula to help develop chrome deposits.

Returning to the U.S., he worked in a Nevada magnesium plant, in a Kaiser Steel Corp. plant, on the construction of a Naval Ordnance testing plant in the Mohave Desert.

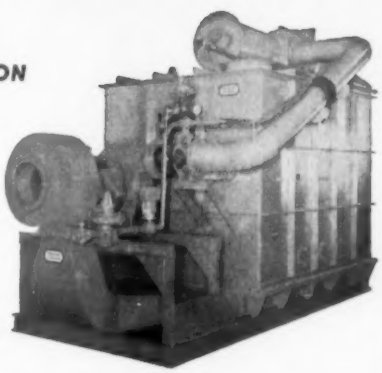
In 1947 Taylor answered an Armco newspaper ad and shipped out to Saudi Arabia as gangpusher of a 150-man crew in a rock quarry near Dhahran. He became a safety engineer in 1951, in Dhahran, and transferred to the Abqaiq district the following year as district safety engineer.

**Tayor calls his experience in construction and mining operations invaluable in oil safety work.** "There never has been a man killed under my supervision while working underground or in heavy construction," he says. "I'm proud of that. The idea is to get men to do the job right. Then they won't get hurt. That's what I mean by safety—it's just another form of good operations."


**NEW... ADVANCED DESIGN**

**FOR HEATING PURE AIR UNCONTAMINATED BY PRODUCTS OF COMBUSTION**

Available for operation over exceedingly wide range of process air pressure and temperature requirements.



TODD Thermo

**INDIRECT AIR HEATERS**

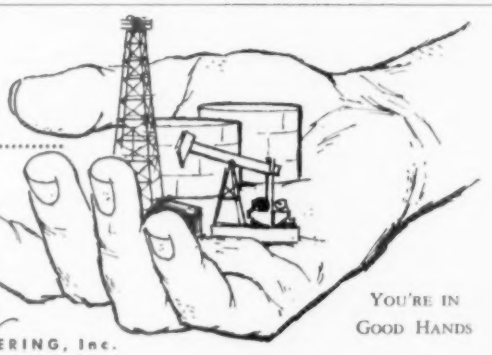
Single unit package design with built-in efficiency for firing all types of oil and gas fuels. Completely automatic, trouble-free performance . . . small initial cost . . . low operation costs . . . compact . . . low maintenance! *Also made as Direct Fired Heaters.*

Send us your particular process air heating requirements . . . we will supply complete recommendations gratis.

**TODD SHIPYARDS CORPORATION**
***PRODUCTS DIVISION***

***Sales and Service Departments:*** Colombia and Halleck Sts., Brooklyn 31, N. Y.
***Plant:*** Houston 15, Texas

*oil and gas property management.....*



W. E. Stiles ENGINEERING, Inc.

YOU'RE IN GOOD HANDS

MAYO BUILDING / TULSA, OKLAHOMA / LUther 4-3556

# NOJC Leaders Review Ills and Gains

Miles Mills Sees . . .

## Little Relief in Proposed Cures

**"Our many ills . . . are no better today than they were at the time I originally discussed them," Miles M. Mills told jobbers last week.**

Mills, who has been president of the National Oil Jobbers Council for the past two years, made his final presidential address last week at the NOJC annual fall meeting in Chicago.

"Most of the cures I have prescribed or advocated have resulted in little relief," Mills lamented. "However, I do have a feeling of hope that the many things adversely affecting jobbers and marketing in general will continue to be discussed, and that positive action will be taken."

**Mills scored refinery practices that result in excessive supplies of gasoline and fuel oil as the cause of much of the difficulty that is facing jobbers today.**

The former NOJC president described the practice of "incrementation," which, he said, is followed by major and independent refineries. This practice encourages suppliers to operate at rates as high "as 110% of capacity," he said.

As Mills described the practice, "Total overhead and general administrative expense is applied against the normal rate" of refinery operations (80% to 85%). This means that every barrel of throughput above that level is far more profitable, so top management insists on the refineries producing these "incremental barrels."

This additional "increment," said Mills, is "forced by top management on upper-echelon sales personnel who are required to unload the finished refinery products, any way they can, preferably outside of their concentrated marketing areas, and at any price."

**Shifting his censure to the "top management" men who are responsible for these practices, Mills apologized to marketing vice-presidents whom he has "vehemently criticized in the past."**

It is not the marketing vice-president, who must dispose of the "incremental" refinery output, who is to blame for the "terrible conditions" in the oil industry today, Mills hinted.

Marketing executives are forced to neglect their regular work in order to dispose of excess stocks, Mills said. Describing a recent motor trip, Mills remarked that he had not seen "such unkempt, dirty" service stations and "such poor service" in 25 years.

**Mills proposed that major supplying companies should "drastically improve their Washington personnel" so they can fight as a team with the jobbers for mutually beneficial legislation to correct industry ills.**

"Too much of the fighting in the past has been left to the National Oil Jobbers Council," he said, "with the help of a very few effective permanent major Washington representatives."

Mills pointed to "S-11 and the so-called functional discount bills," against which jobbers have presented a "lonely stand."

**Mills also recommended that suppliers "give much more thought to top grade jobber-dealer liaison men."**

"I feel that the men preferably ought to be chosen from either sales management, or presidential or board member assistants with marketing background," he suggested.

Mills pointed to the recent appointment of Don Miller to be president of Skelly Oil Co. as an example of the type of promotion he feels represents a favorable trend. As Mills pointed out, Miller came "up from the ranks in marketing."

Otis Ellis Notes . . .

## Big Savings in 'Gas' Tax Shift

**The new gasoline tax provision in the Internal Revenue Code will save oil jobbers between $6-million and $8-million a year, according to Otis Ellis, general counsel for the National Oil Jobbers Council.**

The provision, which will become effective Jan. 1, 1960, shifts the level at which federal gasoline taxes are to be paid by jobbers.

This provision, long sought by jobbers, stipulates that qualified jobbers may elect to pay the 4¢ federal gasoline tax after they have sold the fuel, rather than when they purchase it from their suppliers. One of the requirements for qualification is that jobbers must post a bond of $2,000—or higher if the anticipated quarterly federal tax collections exceed that amount.

The new provision, which was filed Oct. 28, permits jobbers 30 days from that date to seek revisions. Although some modifications may be sought by jobbers, Ellis told PETROLEUM WEEK, he believes that the new provision will be accepted by jobbers substantially as it now stands.

Some industry sources believe that the new tax provision will benefit only a handful of jobbers. They say

that the bond requirements are too stiff for small jobbers to meet.

**In addition to freeing working capital that is tied up in federal taxes, the new provision is viewed as saving jobbers money in several ways.**

Ellis outlined the following advantages of the new law before the jobbers who attended the NOJC fall meeting in Chicago last week:

- The loss of federal taxes paid on gasoline that is subsequently evaporated or spilled will be avoided.
- Insurance rates on gasoline storage will be lower, reflecting the reduced investment in gasoline inventory.
- State and local taxes that are charged on top of federal taxes will be lowered accordingly.
- Taxes on inventories will reflect the reduced investment in gasoline.
- Jobbers who sell tax-free motor fuels to farm accounts will no longer have to fill out forms to get a return of the federal taxes they have paid on the gasoline that is blended into these special fuels.

Throughout, Ellis said, the new provision puts jobbers on a par competitively with suppliers, who have not had to pay federal taxes to the government until they received the money from distributors or consumers.

**Ellis also summarized a list of federal legislation that remains of potential concern to jobbers.**

Ellis reminded the jobbers that a federal fair trade bill is "still hanging fire" in both houses of Congress. NOJC has consistently opposed federal fair trade.

S-11, the bill that would eliminate "good faith" lowering of prices to meet competition as a defense against price discrimination, still lies dormant in the Senate, said Ellis, adding that he hoped the bill would continue to sleep.

The general counsel also noted that the Kennedy minimum wage law threatened to extend the minimum wage to all jobbers, in addition to raising the minimum by 25¢ an hour.

The possibility that Congress will pass a bill next year is slight, said Ellis.

Two factors give the bill little chance of succeeding during the next legislative session, in Ellis's opinion:

- With elections coming up in the fall, legislators will be unwilling to tackle so controversial an issue as natural gas pricing.
- Furthermore, Lyndon Johnson (D., Tex.), Senate majority leader, cannot be expected to lend his support to the controversial measure in view of his candidacy for the presidency.

If President Eisenhower comes out in favor of a natural gas bill, Ellis feels, that would create still another reason for Johnson and House majority leader Sam Rayburn (D., Tex.) to "drag their feet on the measure."

# What's New / IN MARKETING

**Esso Standard Oil Co. last week wiped out its recent fair-trade price cuts in North Carolina with a single 4¢ price increase to 20.9¢ a gal. (ex tax).**

Starting in early September, Esso and other fair trading suppliers had reduced their minimum prices three times, to 16.9¢, to meet local price war conditions.

These frequent price changes prompted North Carolina's Attorney General, Malcolm B. Seawell, to charge that fair trade has caused price wars to spread throughout his state (PW—Nov.6'59,p126).

•

**Pure Oil Co. will sponsor the first public mileage test of the 1960 compact cars in addition to testing regular models.**

The three-day trials will take place at Daytona (Fla.) International Speedway, Feb. 1-3, 1960.

Cars will be given equal amounts of gasoline and will be run until they come to a dead stop. "Our purpose is to give all 1960 U. S. standard production passenger cars . . . a chance to strut their stuff on a fair basis," says Harry L. Moir, Pure's assistant vice-president and general manager, retail.

•

**Cities Service Oil Co. has strengthened its market position in Connecticut with the acquisition of three distributors.**

Last week, Cities Service announced that Valley Oil Co., of Portland, had become a distributor for the company, adding 50 service stations to the Cities Service list.

Earlier this year, Acme Oil Co. and Center Independent Oil Co. signed up as distributors of Cities Service products. They operate approximately 80 retail and wholesale outlets.

•

**The Teamsters ratified a 10¢ hourly wage boost for about 4,000 tank truck drivers in Chicago last week.**

The new pay scale is now $2.95 per hour for day work, and $3.07 for night shifts.

The drivers also won $1 a week in additional employer contributions to health, welfare, and pension funds.

•

**Teamster Union plans to organize service station attendants in Michigan have hit a stumbling block.**

Teamster Local 614 and the Michigan Gasoline Station Attendants Union have come to a parting of the ways. The reason is reportedly that MGAU President Joseph Corey greatly exaggerated his membership when he led this group into affiliation with the Teamsters (PW—Aug.28'59,p 43). It is understood that dues gained by the teamsters from the merger were not sufficient to pay Corey's and Secretary Robert McLaughlin's weekly $150 salaries as Teamster Union officials.

•

**"A full-swing marketing revolution" is just around the corner, according to F. Cushing Smith, of Standard Oil Co. (Ind.)**

Marketers faced with the "age of interurbia" and the "era of the throughway and expressway," will have to step up methods to bring the gasoline supply to the motorist, Smith commented.

•

## Engineering

**The Bennett Pump Division of John Wood Co. is adding an interlock to its gasoline pumps, which will insure that register dials are returned to zero before each delivery.**

With the interlock, it is impossible to start the pump motor until the register is reset. When the pump or dispenser is operating, the interlock also prevents any one from resetting the register to indicate a smaller delivery.

**CRAIG M. ROWLEY** has been elected president of Parkersburg Rig & Reel Co., Houston, a division of Parkersburg-Aetna Corp. He was formerly executive vice-president and general manager. Before joining Parkersburg Rig & Reel in 1957, Rowley was chief petroleum engineer for Sinclair Oil & Refining Co. in Venezuela.

L. W. Jones

C. M. Rowley

**L. W. JONES** moves up to sales manager of foreign operations for the Baroid Division, National Lead Co., in Houston. Jones, with the division since 1945 was named export manager at Houston in 1951. In this capacity, Jones worked with the company's overseas affiliates, including Baritina de Venezuela, S.A., Barytes & Minerals, Ltd., in Trinidad, and Baroid-Maffei SpA, in Milan, Italy. **W. B. Boutwell, Jr.**, formerly Bariod's district superintendent at Tyler, Tex., has been appointed sales representative for foreign operations, with offices in Houston. **O. L. Riley, Jr.**, formerly area engineer at Long Beach, Calif., has been transferred to Alaska as sales representative there.

**S. F. BENNETT** has been appointed managing director of British Timken, division of Timken Roller Bearing Co., in the United Kingdom. The division, which was formerly known as British Timken Ltd., was recently acquired by Timken Roller Bearing through the purchase of the minority stockholders' interest. **Sir John Pascoe**, formerly chairman and managing director of British Timken, will continue as chairman of the new board, and will serve as a director of Timken Roller Bearing. **H. E. Markley**, executive vice-president of the parent company, was also elected a director. He has been with the Timken organization since 1938. **G. F. Copeland** has been appointed managing director of Timken's Brazilian plant, which is currently under construction. He has been with Timken since 1945.

**W. M. BURSTALL** has been promoted to chief tool engineer in the methods and routing department of the Byron Jackson Division of Borg-Warner Corp., in Los Angeles, and **Gale Smith** succeeds him as superintendent of BJ's oil tool plant No. 1 there. Smith was most recently superintendent of the division's Houston oil tool plant. In his new assignment, Burstall will have charge of all machine procurement, tooling, tool design, and method improvements.

**GEORGE F. FOY** assumes the new position of commercial development manager for the chemical products division of Chemetron Corp., with offices in New York. He will be concerned with marketing problems and with the introduction of new products in the chemical process industries. He will also coordinate commercial development activities of the division's Girdler Catalysts unit, Holland Color & Chemical Co., Dunham Chemicals, Rock Hill Laboratory, and Crestwood Chemicals. Prior to joining Chemetron, Foy was in charge of commercial development for Shulton Fine Chemicals, Clifton, N.J. Before that, he was on the staff of Chemical Week, a McGraw-Hill publication.

G. F. Foy

J. M. Gloor

**JAMES M. GLOOR** has been named works manager at the main plant of the Tube Turns Division of Chemetron Corp., in Louisville, Ky. He succeeds **John A. Henby**, vice-president, production, who will now be responsible for current and future manufacturing operations. Gloor, who has been with Tube Turns since 1951, was most recently production superintendent in Louisville. **Morry T. Wakefield**, formerly industrial relations director, succeeds Gloor. **Max B. Densford**, wage and salary administrator, has been named personnel manager, and will assume the duties formerly handled by Wakefield. **Henry H. George** was appointed chief engineer in the product engineering and research department. He joined Tube Turns as manager of research in 1944. **Everett C. Rodabaugh**, principal research engineer, has been assigned added duties as head of the newly created process research group. He has been a research engineer with Tube Turns since 1946.

**C. W. MOORE** has been appointed sales manager of Jones & Laughlin Supply Division's eastern Oklahoma district. Moore, with the division for the past 36 years, was most recently supervisor of store construction and maintenance.

C. W. Moore

P. DeFrank

**PETE DeFRANK** assumes the combined position of manager of research and manager of the perforation flow laboratory for Jet Research Center, Inc., Arlington, Tex. DeFrank has been with Jet Research since 1955. Before that, he was associated with Humble Oil & Refining Co., where he was assigned to the drilling, production, well completion, and workover sections.

**AVERY BROWN** has joined Drilling Analysis Service Co., Denver, as a sales representative. For the past seven years he has been a member of Shaffer Tool Works' sales staff, in Denver and Casper. Drilling Analysis Service is an affiliate of E. A. Polumbus, Jr., & Associates, Inc.

E. F. Shiels

W. M. Marks

J. Hilder

**E. F. (Gene) SHIELS** has been promoted to vice-president, marketing, **W. M. (Bill) MARKS** to vice-president, engineering, and **JACK HILDER** to domestic sales manager, for Ideco, Inc., Dallas, one of the Dresser Industries. Shiels will be responsible for market research, development of new products, sales promotion, and advertising. He has been with the company since 1946, and was most recently vice-president, domestic sales. Marks, who has been chief engineer, will continue to be located at Ideco's Beaumont (Tex.) plant. Hilder, with Ideco since 1948, has served as manager of prices and specifications, assistant to the manager of the Beaumont plant, and assistant domestic sales manager.

Get the best deal ...in Oil Banking!

One of the largest Oil-credit files in the nation . . . and one of the oldest, most experienced Oil-banking departments in the world . . . just —

Think... 1st of Tulsa

FIRST NATIONAL BANK AND TRUST COMPANY

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

SINCE 1895



# All day long, it's RUSH—RUSH—RUSH!

***But there's still time to be well informed on the whole oil industry—with Petroleum Week's variable-speed reading***

**You get a fast-reading summary of every story, just by scanning the bold-face type.** This gives you the essential facts and main points of interest in quick, capsule form.

**The complete details of each article follow in light-face type.** To get the whole story, on items of particular interest, just read the light-face type as well as the bold.

This variable-speed reading technique, pioneered by Petroleum Week, was designed for busy men like you—to give you the industry-wide oil information you want and need, in the shortest possible time.



RIDGID Thread Cutting Oils are available in convenient (4 ounce Nu-Clear only), 1 quart, 1 gallon, (2 gallon Nu-Clear only), 5 gallon, 30 gallon and 55 gallon containers.

## Tests prove RIDGID® Thread Cutting Oil gives you better threads faster...lengthens die life, too!

Recently a distributor in Atlanta, Georgia investigated a complaint of "bad pipe". Test threads were made in all sizes. Torn threads resulted. Then RIDGID Nu-Clear Thread Cutting Oil was substituted for the oil being used. Perfect threads were obtained every time.

Here, then, is dramatic proof that you need a special purpose thread cutting oil . . . an oil that *cools, speeds metal removal, produces a smooth finish,* and *prevents chips from welding to your dies.*

No oil—in its pure state—will perform all these functions. That's why RIDGID Thread Cutting Oils are an exclusive, exactly formulated combination of oils, blended for easier, faster threading . . . longer die life. What's more, these special-purpose RIDGID oils are completely anti-septic . . . no danger of irritation or infection.

**Make sure of good threads every time. Order RIDGID Thread Cutting Oil from your Supply House today. Tops for *all* metal cutting . . . you'll want an extra supply for your lathe, drill press and other metal cutting equipment.**

RIDGID®

The Ridge Tool Company • Elyria, Ohio, U.S.A.

## DEPT/Personals

**CHARLES B. DUKE** is manager of Sun Oil Co.'s newly formed crude oil purchase and sales division, with headquarters in Philadelphia. **D. E. Norris** will be in charge of sales and purchases of foreign crude for the new division, at Philadelphia, and **Robert E. Lee** will be in charge of similar activities within the domestic market, at Beaumont, Tex. **John L. Olsen,** formerly assistant director of technical economics in the research and engineering department, succeeds Duke as manager of Sun's refinery supply and distribution division. **Richard Fleming,** who succeeds Olsen, was formerly his assistant in technical economics. Norris was formerly a crude oil salesman, and Lee was manager of crude oil supply.

C. B. Duke

A. A. Buzzi

**A. A. BUZZI** becomes financial vice-president of Shell Oil Co., New York. He succeds **A. G. Schei,** who will retire on Dec. 31. **R. K. Burns,** assistant controller and assistant treasurer of Shell Chemical Corp., succeeds Buzzi as controller of the parent company. **H. W. Eglint,** special assistant to the controller, succeeds Burns.

**J. R. MacGREGOR** has been named vice-president and a director of California Research Corp., subsidiary of Standard Oil Co. of California. In his new position, he will be in charge of petroleum products research. He succeeds **J. L. Cooley,** who has retired after 40 years with the California Standard organization. MacGregor, with the organization since 1925, joined the research subsidiary when it was formed in 1944.

**W. D. OHLE,** general traffic manager of Sinclair Refining Co. New York, was elected president of the Transportation Club of the petroleum industry, at its annual meeting in Chicago this week. He succeeds **J. R. Lewallen,** Anderson-Prichard Oil Corp., Oklahoma City. Other officers elected at the meeting were: **J. M. Whelan,** American Oil Co., New York, first vice-president; **Ralph L. Andreas,** Standard Oil Co. (Ind.), Chicago, second vice-president; and **Raymond R. Hooper,** Motor Cargo, Inc., New York, secretary-treasurer.

**FRANK H. GOWER,** Denver, was elected president of the Rocky Mountain Oil & Gas Assn. at its annual meeting in Denver last week.

**DR. BERNARD N. ROLFE** has joined Sinclair Research Laboratories, Inc., Tulsa, as assistant director of the exploration research division. Rolfe was associated with the United States Geological Survey from 1951 to 1956. He then served as supervisor of exploration research for Cities Service Research & Development Co., in Tulsa. Earlier this year, he became a consultant on waterflood recovery.

B. N. Rolfe

A. L. Piper

**ALLAN L. PIPER** has been named manager of Tidewater Oil Co.'s eastern division transportation and supply department, and a member of the division's operating committee. He replaces **H. F. Tomfohrde,** who was recently named home office transportation manager, at Los Angeles. Piper, with the company since 1937, served as western division office engineer from 1944 to 1956, when he was appointed assistant transporta-

## ADVERTISERS IN THIS ISSUE


American Cyanamid Co. Industrial Chemicals Div. ..... 89
Atlantic Refining Co. ..... 63
Bechtel Corp. ..... 75
Black, Sivalls & Bryson Inc. Oilfield Equip. Div. ..... 18
Cameron Iron Works, Inc. ..... 12
Campbell-Ewald Co. ..... 8
Canadian Bank of Commerce ..... 41
Catalin Corp. of America ..... 94
Caterpillar Tractor Co., Engine Div. ..... 40
Chemical Construction Co. ..... 11
Christensen Diamond Prods. Co. ..... 37
Cooper-Bessemer Corp., The ..... 100-101
Davison Chem. Div., W. R. Grace & Co. ..... 76
Delta Tank Mfg. Co. ..... 2
Dowell ..... Cover 3
Drilling Specialties Co. ..... 46
DuPont, Petrol Chem. Div. ..... 85-86
Eastman Chem. Prods. Inc. ..... 15
Electro-Motive Div. of G.M. Corp. ..... 6-7
Enjay Co., Inc. ..... 55-58
Esso Research & Engrg. Corp. ..... 44
Ethyl Corp. ..... 66-67
First Nat'l Bank & Trust Co. of Tulsa ..... 125
First Nat'l Bank in Dallas ..... Cover 2
Foster-Wheeler Corp. ..... 43
Gardner-Denver Co. ..... 45
General Electric Computer Dept. ..... 70
Goodyear Tire & Rubber Co. ..... 1
Grove Valve & Regulator Co. ..... 60-61
Hercules Powder Co. ..... 93
Houdry Process Corp. ..... 99
Hudson Engineering Corp. ..... 32-33
Hughes Tool Co. ..... 9-10
Ingersoll-Rand Co. ..... 103
International Business Machines Corp. ..... 96-97
Kellogg Co. M. W. ..... Cover 4
Limitorque Corp. ..... 107
Lone Star Steel Co. ..... 4-5
Magnet Cove Barium Corp. ..... 16-17
Milwhite Mud Sales Co. ..... 35
Mission Mfg. Co. ..... 38
National Aniline Div. Allied Chemical Corp. ..... 69
National Lead Co. ..... 118-119
National Tube Div. U. S. Steel Corp. ..... 83
Nordstrom Valve, Div. Rockwell Mfg. Co. ..... 72-73
Oakite Products Inc. ..... 88
Oil Base Inc. ..... 48
Oil Tool Mfg. Co. ..... 50
Oil Well Supply Div., U. S. Steel Corp. ..... 39
Otis Engineering Corp. ..... 34
Penrod Drilling Co. ..... 35
Petroleos Mexicanos ..... 98
Philadelphia Gear Corp. ..... 107
Price Co., H. C. ..... 27
Reda Pump Co. ..... 36
Republic Aviation Corp. ..... 51
Republic National Bank of Dallas ..... 26
Ridge Tool Co., The ..... 125
Royal Bank of Canada ..... 113
Security Engineering Div. Dresser Ind. ..... 29
Shell Development Co. ..... 80
Southwestern Industrial Electronics Co. ..... 111
Standard Oil Co. (Indiana) ..... 117
Stiles, W. E. Engineering ..... 121
Sun Oil Co. ..... 95
Sun Shipbuilding & Dry Dock Co. ..... 92
Thermoid Div. H. K. Porter Company Inc. ..... 106
Todd Shipyards Corp. (Prods Div.) ..... 121
Union Switch & Signal Div. Westinghouse Air Brake Co. ..... 105
U. S. Steel Corp., Prods. Div. ..... 79
Universal Oil Prods. Co. ..... 64, 90-91



Professional Services ..... 127
Classified Advertising
F. J. Eberle, Bussiness Mgr.
Equipment
Used or Surplus New
For Sale ..... 127


### PETROLEUM WEEK REPRESENTATIVES


Atlanta 3 — Douglas C. Billian, 1301 Rhodes-Haverty Bldg., Jackson 3-6951
Boston 16 — Donald R. Thompson, 350 Park Square Bldg., Hubbard 7-7160
Chicago 11 — Edward A. Callahan, Jr. H. Sherman Davis, 520 N. Michigan Avenue, Mohawk 4-5800
Cleveland 15 — J. E. MacArthur, 1164 Illuminating Bldg., 55 Public Square, Superior 1-7000
Denver 2 — J. W. Patten, Mile High Center, 1740 Broadway, Alpine 5-2981
Houston 25 — D. O. Hanson, 724 Prudential Bldg., Jackson 6-1281
Los Angeles — Peter S. Carberry, 1125 W. Sixth St., Huntley 2-5450
New York 36 — Donald R. Thompson, 500 Fifth Ave., Oxford 5-5959
Philadelphia 3 — W. A. Potter, 6 Penn Center Plaza, Locust 8-4330
Pittsburgh 22 — J. E. MacArthur, Room 1111, Oliver Bldg., Express 1-1314
San Francisco 4 — William C. Woolston, 68 Post Street, Douglas 2-4600
Tulsa 3 — J. A. Hartley, 909 Enterprise Bldg., 522 South Boston, Gibson 7-5594
England, London E. C. 4 — E. E. Schirmer, McGraw-Hill Co., Ltd., 95 Farrington St.

tion manager for the western division. He transferred to the eastern division in that capacity earlier this year.

**ARTHUR S. BERGER** is the new land manager, and **Richard W. Coates** the new general attorney, for Sun Oil Co.'s Rocky Mountain division, with headquarters in Denver. **Leland A. Idler,** formerly senior clerk in the title records department at Denver, succeeds Berger as manager of that department. Coates joined Sun at Denver in 1956 as junior attorney, and has served as attorney and senior attorney there. At the same time, **Frank Neighbor** was named to the newly created position of district exploration manager at Salt Lake City. **Dr. J. Frank Harvey,** formerly with Sun at Bogota, Colombia, succeeds Neighbor as district geologist at Salt Lake City. Other Rocky Mountain division appointments are: **Porter E. Noble,** junior attorney, Denver; **William F. Prescher,** district geologist, Casper; **Pat Sullivan,** junior landman, Casper; and **Mathew S. Tudor,** senior geologist, Bismarck, N. D.

E. U. Cochrane

H. F. Eaker

E. R. Karter

R. E. McGee

**TENNESSEE GAS TRANSMISSION CO.** has named three vice-presidents of its operating divisions, and a treasurer of the parent company. **Edgar U. Cochrane** is the new vice-president of Tennessee Gas Pipeline Co.; **E. R. Karter** vice-president of Tennessee Gas & Oil Co., producing division of the parent company; and **Harley F. Eaker** vice-president of Bay Petroleum Co., refining and marketing division. **R. E. McGee** is the new TGT treasurer.

**D. W. DEVANEY** has been promoted to manager of industrial relations for Continental Oil Co.'s southwestern region, with offices in Ft. Worth. He was most recently director of training for Conoco's manufacturing department, at Houston. Devaney joined Conoco in 1949 as coordinator of training for Cit-Con Corp., Lake Charles, La., an affiliate.

**LOWELL E. HUNT** becomes Seattle regional manager for the wholesale sales department of Standard Oil Co. of California, Western Operation, Inc. He succeeds **S. E. Stretton,** who is retiring. The Seattle office includes western Washington and Alaska. **A. E. Stevens,** formerly manager of the company's motor fuels division, succeeds Hunt as assistant general sales manager, wholesale, in San Francisco. **C. G. Wood,** formerly Fresno (Calif.) regional manager, succeeds Stevens in the motor fuels division in San Francisco. **W. R. Carter,** assistant regional manager in Portland, Ore., succeeds Wood and **A. B. Woodside,** assistant regional manager in Phoenix, Ariz., succeeds Carter. **Howard P. Hetzner,** formerly manager of Western Operations' marketing research in San Francisco, succeeds Woodside.

L. E. Hunt

A E. Herrmann

**A. E. (Ollie) HERRMANN,** Amarillo independent, has been named chairman of the liaison committee of the Cooperating Associations, succeeding **Lester Clark,** Breckenridge independent. The committee was formed two years ago to help coordinate the efforts of 21 producer associations in such fields as imports and gas legislation. Herrmann is a former president of the Texas Independent Producers & Royalty Owners Assn.

**SEYMOUR W. FERRIS** has been named research associate in Sun Oil Co.'s research and development department, at Marcus Hook, Pa. He will work on the development of new products and on new ways to use existing products. **Ivor W. Mills** succeeds Ferris as section chief for industrial products in product development. Mills has been a group leader in research and development.

**CERTIFICATES OF APPRECIATION** were awarded to 27 oil men for their contributions to the industry at the American Petroleum Institute's annual meeting in Chicago this week. Recipients of the certificates given by the production division are: **Paul Andrews,** Signal Oil & Gas Corp., Los Angeles; **C. R. Athy,** Ideco, Inc., one of the Dresser Industries, Beaumont, Tex.; **George E. Cannon,** Humble Oil & Refining Co., Houston; **D. L. Connelly,** Warren Petrolem Corp., Houston; **Harold Denton,** Sun Oil Co., Beaumont; **J. H. Field,** Sohio Petrolem Co., Oklahoma City; and **W. S. Morris,** East Texas Salt Water Disposal Co., Kilgore, Tex. Four who received certificates awarded by the marketing division are: **M. M. Beckes,** Socony Mobil Oil Co., New York; **S. H. Elliott,** Standard Oil Co. (Ohio), Cleveland; **R. W. McDowell,** DX Sunray Oil Co., Tulsa; and **Frank A. Watts,** Humble Oil & Refining Co., Houston. Six recipients in the transportation division are: **Harry L. Cornell,** formerly with Esso Standard Oil Co., New York; **Charles E. Jackson,** DX Sunray Oil Co., Tulsa; **Adolph B. Kurz,** Keystone Shipping Co., Philadelphia; **Robert H. Lynch,** Atlantic Pipe Line Co., Philadelphia; **Leverett C. Monroe,** Union Oil Co. of California, Los Angeles; and **John M. Whelan,** American Oil Co., New York. **A. A. Buzzi,** Shell Oil Co., New York, received the award given by the finance and accounting division. **D. V. Carter,** Mobil Oil Co., Dallas, and **Frank R. Clark,** formerly with Ohio Oil Co., Tulsa, received the awards given by the committee on petroleum reserves. API's certificates in fundamental research were awarded to **Robert E. Loeck** (posthumously), California Research Corp., La Habra, Calif., and John E. Sherborne, Union Oil Co. of California, Brea, Calif. Recipients of awards from the committee on petroleum statistics are **E. T. Knight,** formerly with Atlantic Refining Co., Philadelphia, and **E. F. Perkins,** formerly with Gulf Oil Corp., Pittsburgh. Certificates from the committee on public affairs went to **Joe T. Dickerson,** Shell Pipe Line Corp., Houston, and **Thomas E. Sunderland,** formerly with Standard Oil Co. (Ind.), Chicago, now with United Fruit Co. **B. B. Reeve, M.D.,** Standard Oil Co. (Ind.), Chicago received the award given by the medical advisory committee.


**SEARCHLIGHT SECTION**
*(Classified Advertising)*

EMPLOYMENT — BUSINESS EQUIPMENT — USED OR RESALE **OPPORTUNITIES**

**DISPLAYED RATE**
EQUIPMENT & BUSINESS OPPORTUNITY advertising $16.75 per inch.
EMPLOYMENT OPPORTUNITIES — $28.00 per inch, subject to Agency Commission.
**UNDISPLAYED RATE**
(Not available for equipment advertising)
$1.80 a line, minimum 3 lines.
POSITIONS WANTED undisplayed rate is one-half of above rate, payable in advance.
Box Numbers—Count as one line.
Discount of 10% if full payment is made in advance for 4 consecutive insertions.

**PIPE**
500,000 ft 10¾" O.D. 35#
200,000 ft 12¾" O.D. 40#
200,000 ft 8⅝" O.D. 28#
20,000 ft 16" O.D. 42#
All Machine Cleaned. Plain End. No. 1 Grade.
INDIANA-OHIO PIPE CO.
P.O. BOX 5412 Shepard Sta. Phone CL 8-8527
COLUMBUS 19, OHIO

**PROFESSIONAL SERVICES**

**COLOMBIA AND VENEZUELA**
Scout Reports, Maps, Industry Data
VOSA, Caracas — Apartado 3963 — Tel. 544802
COLSA, Bogotá — Ap. Aéreo 12026 — Tel. 438877
Neal Van Middlesworth

# The Challenge That Faces Oil

THE "FIGHT AND FIGHT HARD" speech that Frank M. Porter made at the American Petroleum Institute's annual meeting this week laid down the gauntlet for the oil industry and the coal industry alike.

The API president made it crystal clear that oil no longer can afford to be indifferent or complacent about its affairs in Washington—and most particularly, about the battle that's mushrooming over the proposal for a national energy policy whose ultimate goal is end-use controls on fuels.

At the same time, he ripped into the coal industry for seeking a legislative remedy for the competitive problems that should be resolved in the market places, in the grand American manner. He minced no words in challenging the tactics and the philosophy of the coal people, and their "Fifth Amendment" allegations against the oil industry.

Our society gives no guarantee of success to anyone, he chided them. Years ago, oil lost ground when electric lights knocked the bottom out of its kerosine market. But it went on from there to greater success, via new markets and new uses for oil. Similarly, fuel oil men are now facing a greater challenge from gas.

ARTIFICIAL CONTROLS ON COMPETITION are not the answer, Porter declared, for this country's inherent strength comes from the freedom of choice that is our right under the Constitution. And, he reminded the coal people, if they succeed in obtaining regulatory controls, who's to say that the encroachment on freedom will stop there? Who and what will be next, if the walls are breached?

Porter's words were tough, but they were like music to many ears. Far too often, the oil industry has been guilty of thumb-twiddling or ineffective shadow-boxing when storm clouds began to gather on the horizon. This time the alert has been sounded. This time the oil industry will have no excuse if it fails to muster its forces before the situation gets out of hand.

THE PORTER SPEECH is one that every oil man should read, and use as a guide in making his own contribution to the total effort.

Some oil men already have taken up the battle. Richard Gonzalez, director and treasurer of Humble Oil & Refining Co., hit the nail on the head recently in a letter to Rep. Wright Patman (D., Tex.). He observed that the coal industry's "real objective . . . is a plan for creation of an agency designed to limit competition from oil and gas in industrial uses."

Oil could use more letters and more speeches like these to bring this matter into proper focus. But more important, oil needs to take action.

## Field Study Shows—
## Treatments Engineered With "Frac Guide" Gave 63% Better Production Increases

Results on frac jobs engineered with the help of the "Frac Guide*" developed by Dowell, are pouring in from all areas. The more these results are compared with results of other treatments, the better the "Frac Guide" looks.

For example, 16 treatments engineered with the "Frac Guide" were recently compared with other treatments in the same area. The treatments engineered with the "Frac Guide" gave from 25 to 138 per cent greater production increases than the other jobs. The average increase was 63 per cent greater when the "Frac Guide" was used.

Studies such as this continue to prove the effectiveness of the "Frac Guide." Each study points up the fact that fracturing jobs engineered with the "Frac Guide" will probably cost less, pay out faster, and produce flatter decline curves.

Call your nearest Dowell engineer for more information. Get him to engineer the treatment on your next well. There is no additional cost. Dowell has more than 165 offices and stations in the United States, Canada, Venezuela and Argentina. Dowell, Tulsa 1, Oklahoma.

*DOWELL TRADEMARK

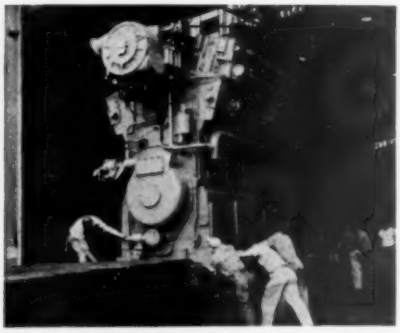
*Services for the oil industry* — DOWELL

DIVISION OF THE DOW CHEMICAL COMPANY

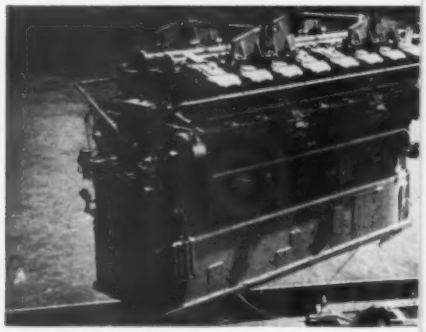
# Landing Craft Cuts Construction Costs

## Kellogg's Procurement Division Avoids Dismantling, Crating, Reassembling in Shipping Huge Diesel Engines to Mobil Oil Company de Venezuela Refinery

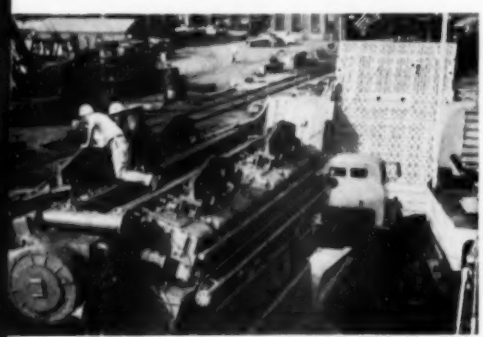
**ASSIGNMENT:** A 50,000 BPD refinery, complete with diesel electric power plant, being built by Kellogg for Mobil Oil Company de Venezuela at El Palito—100 miles west of Caracas, on the Caribbean.



**PROBLEM:** Minimize man-hours for delivering and installing four of these 100-ton diesel engines, required for the power plant, by avoiding the dismantling, crating, and reassembling usually needed.



**SOLUTION:** Have engines sent, fully assembled, by rail to Newport News, Va.—most economic shipping point from vendor's plant, and there hoist them to deck of a commercial landing craft.

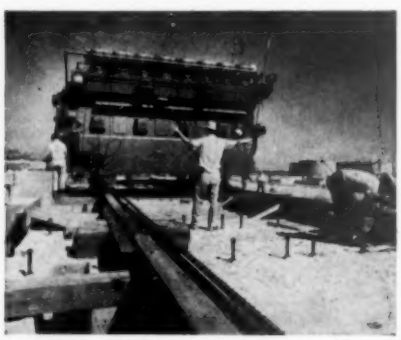


**LOADING:** Also on deck—loaded last so it could go ashore first—is a heavy-duty truck and lowboy, onto which one of the diesel engines has been lowered in readiness for landing near the refinery.

**LANDING:** Ready to move as the craft reaches El Palito, the first engine goes right up on shore—its landing facilitated by an earthern dock, quickly constructed by the refinery's bulldozer.

**HAULING:** With less than 1000 yards to go from landing place to refinery site, truck and lowboy make the first of four trips to complete the 400-ton shipment of diesel engines for the power plant.

**APPROACHING:** With assistance from the bulldozer, one of the huge diesels slowly approaches its destination—where foundations have been made ready to allow immediate installation of all four.



**POSITIONING:** Skids, hawsers, and hoists help to place one of the four engines in position on its concrete foundation, as skilled hands get ready to securely bolt the first unit of the power plant.

**INSTALLED:** Another example of Kellogg's ability to procure, deliver, and install refinery equipment at minimum cost, diesels are installed in Venezuela just ten days after leaving Virginia.

*For the complete story of "Operation Landing Craft", write for illustrated booklet.*

**THE M. W. KELLOGG COMPANY, 711 THIRD AVENUE, NEW YORK 17, NEW YORK**

A SUBSIDIARY OF PULLMAN INCORPORATED

*The Canadian Kellogg Company Ltd., Toronto • Kellogg International Corp., London • Kellogg Pan American Corp., Buenos Aires • Societe Kellogg, Paris Companhia Kellogg Brasileira, Rio de Janeiro • Compania Kellogg de Venezuela, Caracas*

M KELLOGG W